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FEBRUARY 1942

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"CORN STATES"

ON

FOOD FOR DEFENSE

Our country is at war in defense of freedom and our right to live in a peaceful world.

In the line of defense are the producers and conservators of food. The United States Department of Agriculture has asked for the largest hog production in the history of this country and farmers are preparing to answer the call.

Cholera continues to be the principal menace of the swine-breeding industry and the simultaneous method of vaccination is the only adequate protection against it.

In these emergencies, the veterinary service is urgently requested to consider the quality and sources of adequate quantities of the serum and virus it will need during the ensuing year.

With its Multiple Check System of simultaneous virus production and its known capacity for producing and maintaining reserve supplies, "Corn States" is prepared to render notable service to the veterinary profession in the conservation of pork for defense and victory.

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NO. 779

Why Should the United States Lag Behind Other Great Powers in the Military Use of Animals?*

MAJOR GENERAL JOHN K. HERR

*Chief of Cavalry, U. S. Army
Washington, D. C.*

Mr. President and members of the association. I am glad to be here. It is gratifying to be with people who like the horse. I find many who are really hostile to this noble animal. Always I find in them other symptoms of imbalance.

I shall talk to you briefly as follows:

First, a survey of the comparative use of animals in the Russian, Japanese, German, and American armies, with more detailed comparison as regards German and American armies.

Second, I will discuss the present and probable future effect of mechanization and air on the use of animals in war.

Third, I will tell you what our American cavalry really is and how we hope to develop it to keep abreast with changing conditions.

Fourth, a few words concerning the influence of your association, of our remount service, and of mounted sports on the future of the horse.

Fifth, conclusion.

*Read before the annual meeting of the Horse and Mule Association of America, Inc., Chicago, Illinois, December 3, 1941. Published by permission of Wayne Dinsmore, secretary, who was granted permission by the War Department and Cavalry Journal to use the cuts.

1. THE USE OF ANIMALS IN OUR OWN AND FOREIGN ARMIES

a. *General Comparison.* — All foreign armies except the English use animals in great numbers. I will consider only the greatest: Russia, Japan and Germany, with special attention to Germany as first in efficiency.

From the most reliable sources available, it appears that the Russian army has more than 1,000,000 animals; the Japanese army has more than 375,000, and the German army includes, as a conservative estimate, more than 960,000 animals. The American army has 50,000.

Breaking down these figures further, we find:

	For Cavalry Use	For Draft and Pack
Russian Army	200,000	800,000
Japanese Army . . .	50,000	325,000
German Army	50,000	910,000
American Army* . .	25,000	12,000

b. *Use of Animals in Our Own and German Armies.*—As the German army is the most efficient in the world, let us compare

*In remount depots and for administrative purposes, etc.—13,000.

further the use of animals in the German and U. S. armies.

For cavalry purposes, Germans, 50,000; U. S., 25,000.

Although the Germans have but one cavalry division, while we have two, they use much more cavalry than we do for reconnaissance purposes. They have more corps cavalry regiments than we have, except that theirs are made up of bicycle squadrons and marching horse squadrons. I will show later how ours are constituted. They also have smaller horse groups, often a troop, as reconnaissance groups, for their marching divisions. We have no horse reconnaissance groups with our marching divisions, and small mechanized reconnaissance groups with only nine of our divisions. Eighteen of our marching divisions have no reconnaissance groups, either mechanized or horse. The Germans have a scouting platoon of 30 horsemen in each marching infantry regiment. We have none.

For artillery purposes: Germans, 464,000; U. S., 11,000.

For draft and pack other than artillery: Germans, 446,000; U. S., about 1,000.

Thus we see that by far the greatest discrepancy existing in the use of animals between the German army and our own army is found in the use of draft and pack animals, chiefly draft. Why is this? First, let me tell you that the Germans have approximately 25 mechanized divisions, 35 motorized divisions, and 245 marching divisions, *i.e.*, those in which the infantry walks. We have 5 mechanized divisions, 1 motorized division, and 26 marching divisions. It is in the marching divisions that we find the differences.

In the German marching division all the artillery and practically all the other transportation, whether of supply or fighting echelons, is drawn by animals. In our divisions there is not a single animal; all our vehicles are motorized. Why this striking difference? The Germans claim that there is no reason for using motors where animals will do as well. Animals can draw vehicles as fast as men can march, so why use motors with marching divisions? The

Germans use great fleets of motor vehicles to bring supplies from bases to the divisions. Thus it is motors for the long haul and horses for marching transportation. They believe also that it is wise to balance the use of resources. Although we are the greatest motor country in the world, we have vastly more animals than has Germany. With more than 10,000,000 horses and nearly 4,000,000 mules in this country, why should we not achieve a similar balanced use? Although I have tried to find out why we insist on using motors for tasks which the horse can do as well or better, I have yet to find any convincing answer. I do not believe there is any adequate answer. If we used animals to the same extent as do the Germans, over 4,000 per infantry division, we would need 100,000 more animals, chiefly of the draft type. About 50,000 of them would be for artillery use. What does the Chief of Field Artillery, General Danford, think about it? I quote from one of his addresses to which he still adheres:

c. General Danford's Opinion.—"At this time, it seems appropriate for me again to make a few remarks with reference to the oft recurring argument of horse *versus* motor, and to state my views thereon.

"I have frequently remarked that I believe the easiest thing the field artillery could accomplish today would be to eliminate the horse completely from the army. Congress and the country are definitely machine-minded and many brilliant officers simply can not see horse-drawn field artillery except as a relic of a bygone day. Student officers at our service schools, and commanders and umpires in our maneuvers, do not like to be slowed down by a horse-drawn artillery. In our map rooms we magnify the importance of strategic mobility, while we ignore almost completely bad weather, bottomless roads, and their effect on battlefield mobility.

"*It is my belief that in war every means and agency procurable will be utilized in the prosecution of the war. It is conceivable that, as in the last war, the steel capacity of our country can not satisfy the well nigh insatiable demand for airplanes, tanks,*

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Top—German cavalry crossing the Berezina River west of Smolensk. In the wedge and kessel operations horse cavalry fills the gaps, maneuvering in terrain too difficult for motorized and mechanized units.

Bottom—The 107th U. S. Cavalry in Louisiana. The horse unit of the H-M combination reduced the road jams so that the motor units could advance.



motor vehicles, guns, ammunition, bombs, manufacturing machinery, civilian needs, etc., and that someone in authority will say to the then Chief of Field Artillery, 'Animals can be used by you—this country's horse population is enormous. You must plan to utilize it to the fullest extent possible.'

"I can see no argument about this matter myself. The motor is far superior to the horse in some situations, while the horse is superior to the motor in others. For light division artillery, the horse still remains superior as a prime mover off roads through the mud, the darkness and the rain. He does not scrape open his belly on a rock, he does not fall off an embankment, he does not smash his head against a tree, and he still works a bit longer when his fodder is exhausted. In other words, the horse can be used by us, and he still remains superior to the motor, in what are usually the most difficult situations involving the emplacement of guns to support the jump-off of the division infantry at dawn. To disregard him during peace in favor of the motor, 100 per cent, is simply putting all our eggs in one basket, and is, in my judgment, an unsound policy. There is today a minimum of argument regarding this matter within the field artillery itself. We have pretty well accepted the idea that with the National Guard 100 per cent motorized, the regular field artillery officer is not 'horse or motor,' he is 'horse and motor' and must qualify himself to utilize both to their maximum degree of efficiency."

d. *Discussion.*—The situation so wisely forecast by the Chief of Field Artillery is now here. We can not now fill the insatiable demand for airplanes, tanks, motor vehicles, and other war supplies now vitally necessary for the equipment of our own forces and those of our friends. The time is now here when we should utilize the horse to the fullest extent possible, thereby releasing the products of industry for other vital needs. This is obviously a matter of common sense. Although we are now over-motorized, this can be adjusted by replacing motors by horse drawn vehicles in at least one-half of our marching divisions

and by using animals in all marching divisions to be formed in the future. Will we be wise enough to do this? I doubt it. The motor-mad advocates are obsessed with a mania for excluding the horse from war. This idea always gets a favorable press.

2. PRESENT AND PROBABLE FUTURE EFFECT OF MECHANIZATION AND AIR ON THE USE OF ANIMALS IN WAR

a. *General.* The German armored force-air team has profoundly influenced the trend of present warfare. It has restored the war of movement. Why? First, because of perfect teamwork. Second, because the tanks are invulnerable to the small arms fire of rifles and machine guns. Third, because the Germans have had overwhelming air superiority. Superiority which not only swept enemy air from the skies and secured complete information of enemy movements, but which by use of stuka dive bombers and attack planes actively attacked enemy groups endeavoring to block the advance. Without such overwhelming air support, the swift advance of armored forces would be impossible. Nevertheless, the Germans have restored the war of movement. This has affected to a considerable degree all of the combat branches. They have motorized 35 infantry divisions to more swiftly support the fast-moving armored divisions. They have also motorized part of their artillery to move in swift support. Remember, though, that the backbone of the German army is 245 marching divisions which follow to occupy, mop up, and fight when the spearheads are stopped.

b. *Effect on Cavalry.*—This getting into the open is a happy break for cavalry. Unfortunately for the Germans, although they had reconnaissance units for the regiments and divisions, they had but one cavalry division. In the advance into Russia they lacked the cavalry strength in divisions and corps which would have greatly assisted them. Consequently, after the breakthrough of German armored forces, the Russian enemy often closed in along the line of advance and pinched off vulnerable



Mounted soldiers can ford streams where motorized units must halt until engineers with men and cumbersome material can be brought up to construct a temporary bridge—an operation which causes costly delay and gluts the highways to the detriment of advancing troops.

or, they can swim across deep streams the men and matériel required for cutting the enemy's line of communication and otherwise hampering its operations; cavalry is ideal for these vital purposes; but when trails are narrow, barely



wide enough for mounted soldiers to advance single file, the obstacle to the rapid advance of motorized units is insurmountable; they can not whirl about and disperse like mounted units in escaping from gunfire.



motorized infantry which followed. The Russians also frequently interposed between the motorized infantry and the marching divisions. Isolated armored units were surrounded and destroyed. Guerrilla warfare flourished. The tank elements were ambushed by anti-tank units.

Cavalry can cope with all these situations. It will ferret out anti-tank units waiting in ambush. It will protect the flanks of the motorized infantry in battles and form a link with the slower following marching divisions. It will cope with guerrilla warfare. It is well suited to hunt

"1. I wish to express to you and all the personnel of your fine division my appreciation and that of the entire personnel of the 1st Armored Corps for the splendid coöperation and assistance received in forcing a crossing of the Sabine River at Joaquin on September 28, 1941. The successful crossing of this river and the establishment of an effective bridgehead could not have been accomplished in the prompt and efficient manner that obtained, without your bridge equipment and without the most remarkably efficient crossing of your horse elements over a foot bridge. . . .



Horse-drawn artillery crossing the Sabine River on a pontoon bridge. The horses are unhitched and strung out and the men draw the guns across to spread out and lighten the bridge's load. Bridges for mechanized units must be more substantial and require more time and material to build.

down parachutists. It has the flexibility and mobility which enables it to fill in all the weak gaps.

Under no circumstances should we blindly ape the Germans. If we give scope to our imaginations, we may, by the addition of cavalry, forge the strongest spearhead of exploitation yet devised.

I believe many of our progressive thinkers hold this view. In this connection I wish to quote extracts from a letter of Major General Charles L. Scott, United States Army, commanding the 1st Armored Corps, to Major General Innis P. Swift, commanding the 1st Cavalry Division.

"3. I regret that the exercise did not continue through another day because I believe that your division could have demonstrated most conclusively that it could assist armored units in their movements forward over difficult terrain and could follow up promptly and effectively the attack of these units after it had been launched."

As many of you know, General Scott was at one time head of the Remount Service and one of our noted horsemen, and it is not surprising that he is able to appreciate the value of horse elements. Thus, strange as it may seem, mechanization, by its great

Mounted patrols can reconnoiter along narrow roads, across fields and through brush and woods and they can quickly disperse out of range of enemy fire.



This is a photograph of a cavalry detachment leaving bivouac at Creston, Louisiana, during the recent simulated warfare in that sector.

A horse patrol of eight men and ten horses, leaving to obtain information on enemy strength and location; it is equipped with radio in addition to the arms now carried by mounted soldiers.



part in restoring the war of movement, has increased the opportunities for the use of cavalry.

(2) RELATIVE INCREASE IN AIR POWER

We trust the war of movement will continue and we believe it will, but we foresee a radical and swift change in relative powers of the armored force power and air power, which will affect the war of movement.

(a) *Anti-tank Threat.*—First, the power of armored forces will decrease because of the anti-tank threat.

The development of fast-moving anti-tank units, the core of which will be self-propelled vehicles mounting guns capable of shooting holes through any tank, will stop armored vehicles just as the machine gun stopped men. Although armored force commanders hold that the only answer to armored units is other armored units, I can not agree. Theirs is a natural and interested viewpoint because it means more tanks. The answer to the armored knights was also presumed to be more armored knights, but the projectile gave a swifter and cheaper solution. You will recall that the arrows of the Incas and Aztecs glanced harmlessly off the mail-clad knights of Pizarro and Cortez, but when the English crossbow and later the musket came upon

the scene, the armor was relegated to the museum. Likewise, although the present armored units are invulnerable to small arms fire, it is possible to produce myriads of anti-tank weapons to which they are vulnerable and which can be moved around just as fast as tanks and probably faster. In view of the fact that the present tanks cost about \$1.00 a pound, i.e., a 15-ton tank costs about \$30,000, while for the same money scores of unarmored vehicles carrying anti-tank weapons may be produced, there can be but one answer. As a matter of common sense and of dollars and cents, the diminishing power of the tank is indicated. The experience of the experimental anti-tank squadron formed by the 1st Cavalry Division for use in Louisiana maneuvers supports this view. The core of this force consisted of 36 "bantams" or ¼-ton trucks with 37 mm. guns mounted on them. About 72 ¼-ton trucks were used as accompanying vehicles to carry ammunition and with machine guns mounted on them to cope with enemy infantry. This squadron proved extraordinarily successful. The report shows that the armored forces feared it more than any other opposing unit; that this force not only destroyed attacking tanks but also was able to hunt down and destroy tanks. Remember, anti-tank development is in its infancy.

(b) *Air.*—Second, the power of armored forces will decrease because of the constantly increasing air power.

Great as air power now is, it is still in its infancy. Soon we will have planes mounting highly effective anti-tank guns. What will be the effect of the anti-tank gun, the bomb, and the machine gun, respectively, on the tank, and unarmored vehicles, and the personnel in trucks? It needs no vivid imagination to foresee the carnage. Whenever enemy



Cavalry unit taking a rest and watering its horses. Scene at El Camino del Rey, Louisiana.

air units can establish superiority, armored forces will be destroyed. It will be like hawks swooping down on rabbits in their runways.

Discussion.—Thus air power will become the strongest factor in causing a breakthrough and a war of movement. The relative power of armored forces will diminish. The relative power of cavalry will increase as a member of the ground exploitation team because of its cross-country mobility and powers of dispersion, which enable it to avoid losses from the air and continue to move. These inherent powers also enable cavalry to evade tanks, continue on, and attack supply columns and infantry in trucks.

Cavalry will disperse for protection and proceed on its mission.

3. OUR CAVALRY AND ITS PROBABLE DEVELOPMENT

a. *Our Cavalry.*—(1) *General.* Our cavalry is, I believe, the best in the world. This is because it has developed in a different manner from European cavalry. Instead of fighting mounted, our mounted troops have followed the methods of Sheridan, Buford, and Forrest, fighting almost always dismounted and using the horses to place our riflemen and machine guns in an advantageous position. The ordinary citizen does not realize this. He is misled by incredibly stupid writers who persist in picturing cavalry as medieval knights insanely committing suicide by fighting mounted against modern tanks and machine guns. I saw such an absurd article in a recent issue of a specialized-interest publication. The story was entitled "War and Horses." Funnier still was the caption on the booklet, "A Magazine Devoted to Horse Breeding."

I will tell you what our cavalry really is. It numbers about 30,000 men and consists of 21 regiments and 10 separate troops. Nine of these regiments are National Guard and 12 are Regular Army. Ten of the regiments go to make up our two regu-

lar cavalry divisions of four regiments each, and the 56th National Guard Brigade of two regiments. These large groups are primarily for use in large operations to assist armies or groups of armies. They may be organized as a cavalry corps under GHQ combat or may be separately attached to armies.

(2) *Reconnaissance Units.*—The smaller units, consisting of 11 regiments and 10 mechanized troops, are chiefly for attachment to infantry units, mainly for purposes



To understand modern cavalry operations one must remember that for rapid, long-distance maneuvers the horses and men are carried forward in "horse portées"; in effect the entire cavalry regiment with all of its men and equipment, its forage and rations, is carried on wheels. The rate of march is over 30 mph, or 200 miles per day.

of reconnaissance and scouting. Thus nine of these regiments are horse and mechanized corps reconnaissance regiments.

(a) *Horse and Mechanized Regiments.*—Our horse and mechanized regiments consist of a mechanized squadron of scout cars, bantam cars and motorcycles, and a horse squadron of 555 horses porteed, i.e., with each complete fighting unit a squad of eight men, eight horses, equipment and arms carried in a truck-tractor with semi-trailer. The entire horse squadron is loaded in from five to seven minutes. The signal platoon, anti-tank platoon, and pioneer platoon are motorized so that this entire regiment can move on wheels. They are part of the army corps for use as reconnaissance regiments. One of these regiments, the 4th U. S. Cavalry, during the maneuvers of last summer marched approximately 5,000 miles from Fort Meade, South Dakota, to Louisi-

ana and return, participating in all the maneuvers. The rate of march to and from the maneuver area was over 200 miles per day at an average rate of 25 miles per hour, with a cruising rate of 30 miles per hour. Because of its power to bring its animals fresh to the battle area and then to operate with both machines and horses over all types of terrain, the horses often swimming streams and traversing areas inaccessible to vehicles, it was highly successful and earned the plaudits of all commanders. During this entire period of almost two months, only six horses were evacuated—five for wounds and one for laminitis. The horses were in fine shape at the conclusion of the maneuvers, showing the value of using motors to conserve the horses.

(b) *Mechanized Troops.*—Nine of the scout car reconnaissance troops are for reconnaissance units for the nine triangular divisions. Unlike the Germans, we have no horse reconnaissance groups with our infantry divisions and regiments. We need them. Obviously the combination of horse and motor is the most effective organization to conduct reconnaissance over all kinds of terrain. Vehicles are largely restricted to road reconnaissance. We should also have at least one squad of horses porteed for use of all division and corps staffs, both infantry and armored, for use in detailed staff reconnaissance. This would also save some of our generals from capture.

(3) *Cavalry Divisions.*—(a) *Composition.*—Each cavalry division is a self-contained fighting unit, supported by auxiliary arms and services, just as in an infantry division. The horse strength of a cavalry division is 7,413 of which 6,080 are used in the four regiments for riding and pack and 1,156 used by the two horse artillery battalions for draft and riding. There is a troop of pack mules in the Quartermaster Squadron. All other units are mechanized and motorized. This includes the fighting units of one battalion of 155 howitzer artillery anti-tank squadron and mechanized reconnaissance squadron of two bantam troops, a motorcycle troop, and a light tank troop. This is largely because horse-drawn vehicles can not keep up with our marching

cavalry. Also, all service units such as Engineers, Signal, Medical, and Quartermaster are motorized. We have in our Quartermaster Squadron two troops of truck-tractors with semi-trailers, like those in the horse and mechanized regiments, capable of transporting one squadron of horse cavalry. Thus, in our cavalry divisions, we use both motor and horse for reconnaissance purposes. We have no prejudice against the motor or against mechanization, as is shown by our employment of both where helpful.

(b) *At Maneuvers.*—Maneuvers at their best are highly artificial. In recent maneuvers, the cavalry divisions were used chiefly on the flanks for wide sweeping operations, sometimes in combination with armored forces. These missions were suitable and effectively accomplished, although requiring unusually long and forced marches to adjust their movements to the unnatural speed of approach of the opposing infantry forces, moving in trucks along the motor roads. In war, enemy air would attack the truck columns. If released, squadrons of enemy cavalry, infiltrating forward between roads, could have waylaid, ambushed, and ruined most of these columns racing down the roads with no reconnaissance of intervening country.

Another artificiality incident to this type of maneuvers was the necessity for cavalry to make long road marches between phases or problems to reach new positions according to the pasteboards set up on the great map of the control room. After prolonged tactical marching in one exercise or phase, it is a bit annoying for cavalry to be obliged to make long marches to new positions, and to plunge immediately into a second exercise with no rest for horses or men, while all other troops were shuttled by motor to new positions. These things actually happened. For instance, between the first and second phases of the GHQ exercises, the animal elements of the 1st Cavalry Division marched almost 100 miles in the interim of four days, while everyone else was motoring or resting.

During the period, August 17-October 1, the 1st Cavalry Division marched about

1,000 miles with little rest. On one occasion it marched 73 miles in 39 hours. Again it marched 44 miles in 20 hours, crossing the swiftly flowing Sabine River, and delivered a decisive blow against the right rear of the enemy army, capturing and destroying the gas supplies of the 2nd Armored Division. Again it marched 71 miles in 35 hours, again crossing the Sabine River, swollen by rains to a depth of 10 feet, and established a wide bridgehead for the crossing and development of the 1st Armored Corps. The 2nd Cavalry Division performed scarcely less notable feats. It was the only large force which could be extricated from combat and speeded to combat the 1st Cavalry Division in its drive against the supply lines of the wing. It may interest you to know that in spite of having it tougher than anyone else, the cavalry soldiers, although driven to the utmost effort, were at the end of these maneuvers cheerful and ready to go on. It was really inspiring. There has never been any question as to the morale of our cavalry.

(1) *Horse Casualties.*—Considering the conditions, the horses held up mighty well also. Of a total of 11,000 animals in the two divisions, the total number of evacuations which includes all absence from duty, although often for trivial injuries and for a few days only, totalled 2,722. Of these 1,400 were returned to duty during maneuvers, and by the end of October, all but 120 had been returned to full duty. Only 87 animals died or were destroyed. It may interest you to know that the majority of these horses were remounts of less than six months' service. The 1st Cavalry Division had 25 per cent remounts. Of these, 864 were five-year-olds and 44 four-year-olds. The 2nd Cavalry Division, which was expanded rapidly, had 95 per cent remounts. Of these, 976 were five-year-olds and 57 four-year-olds. Horses over six years of age showed up much better than the others. As I have stated, out of 450 horses of the 4th Cavalry, only six were evacuated. Had truck-tractors and semi-trailers been available to shuttle our division horses, the evacuations would undoubtedly have been similarly reduced.

(4) *Horse with Motor.*—Arrived in the battle areas, where roads can be used but little, cavalry has greater tactical mobility than any other arm. Why not give it the same strategical mobility as other troops have? It is just as easy to transport horses on motors as to transport men or guns. It is done by rail. Why not by motor? The chief criticism of cavalry divisions has hinged on the lack of strategic mobility in competition with the motor on the road. Why not give them the motor? I tried to secure these but met with opposition. First, it was claimed that the truck-tractors with semi-trailers had not yet thoroughly proved themselves, and that we should wait until after the maneuvers to find out. To my mind, they had already been proved. The other objection was that "Transportation which must itself be transported on occasions is obviously inefficient. It must justify itself by other essential qualities, which are not too apparent in horse cavalry." There you get the picture. Reluctance to place the horse on a par with the man and skepticism as to the value of cavalry. The fine performance of our cavalry divisions at maneuvers did much to dissipate this unbelief in cavalry. The truck-tractors and trailers proved highly successful. And, I now have hopes of accomplishing my purpose to equip the division with horse carriers for long hauls.

b. *Probable Development.*—Our cavalry divisions should be so developed as to enhance their unique power to disperse under control moving over all kinds of terrain. This involves the use of air transport to replace much or all of the wheeled transport for purposes of supply. The employment of only such combat vehicles as possess the greatest degree of cross-country mobility, such as bantam cars. The use of horse trailers to increase strategic mobility. Attached air bombardment groups to furnish swiftly moving air artillery support. Grasshopper planes to insure control of dispersed forces. We must so develop our individual soldiers and small unit leaders as to be able to find their way over unknown terrain singly or in small groups, and to care for themselves and their ani-

mals as did the scouts of frontier days. The training of a military team is like that of a football or polo team. Stress the fundamentals to perfection. Then build up the teamwork. We can do these things if given the green light.

4. INFLUENCE OF THE HORSE AND MULE ASSOCIATION OF AMERICA, OUR REMOUNT SERVICE AND MOUNTED SPORTS

You of the Horse and Mule Association and we of the army have a community of interest in the development of the horse. As we know, in these motor-mad days it is difficult to get a square deal for the horse. This applies to both civilian and military. You are aware of the aggressive efforts of certain motor interests to push their products by publishing pamphlets comparing horse and motor and teeming with exaggerated and untrue statements which you have exposed. You have not the promotion funds at your disposal. You might try forming some corporations of horse and finance to enable you to offer some fine animals for a small down payment and monthly installments to include insurance at 12 per cent interest or more. Anyway, you are doing a fine constructive job in advancing the interests of the horse.

Our Remount Association has also done a wonderful job as you know. It purchased during the fiscal year 1941:

Horses, Riding	22,720
Horses, Draft	1,333
Mules, Pack	4,096
Total	28,149

Its authorized purchases for the fiscal year 1942 were:

Horses, Riding	4,785
Mules, Draft	342
Mules, Pack	1,799
Total	6,926

During the fiscal year 1942 up to December 1, 1941, it purchased:

Horses, Riding	3,140
Mules, Pack	198
Total	3,338

I have observed all the remounts sent out during the expansions to cavalry units, and I concur with the various commanders that this is the best group of remounts ever sent to our units. This reflects just credit on Colonel Hardy and his subordinate officers. As you know, the quality of horses in this country has greatly improved by reason of the intelligent efforts of your association and our remount service. In so far as military uses are concerned, this has more than counteracted the decline of numbers. I feel sure that this improvement in quality will also tend to stimulate the demand for animals, especially at this time when motors are needed for other purposes. It is an opportune time to urge the use of animals where possible to replace the motors.

We must continue to encourage all mounted sports, such as hunting, horse shows, racing, steeple-chasing, and polo. All these require a fine type of horse and promote good breeding. From a military viewpoint such sports are of untold value in stimulating those qualities of dash, courage, and endurance, which one needs in fast-moving war. Of all these sports, I regard polo as of greatest value to the soldier. It is a real, practical school of training for a leader. It not only requires qualifications of training and riding, but the game demands teamwork, an awareness of the whereabouts of all players, both friend and foe, anticipation of play, instant decision, and rapid execution. It demands physical and mental activity. Swiftens of action will not compensate for sluggishness of thought. Good polo players are generally fine cavalry leaders. Almost all our cavalry commanders of division, brigades, and regiments have achieved distinction in the game of polo.

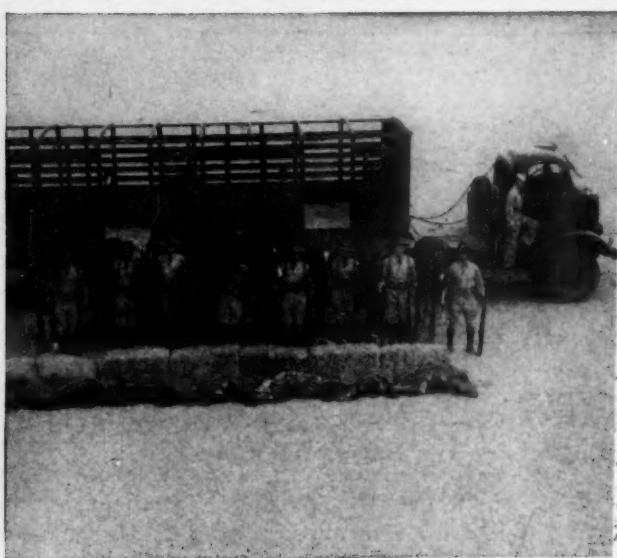
5. CONCLUSION

a. From the standpoint of military efficiency and a balanced use of our horse and motor resources, it is believed we should use animal instead of motor transport in a proportion of our marching divisions.

b. We should add to the Armored Force



Left—Portée cavalry unit unloading. Time of loading or unloading, six to eight minutes. Such units have the same motility as motorized infantry and have the advantage of more rapid movements at destination.



Right—Portée cavalry unit ready to load. Capacity, eight horses and eight men. The porteed cavalry unit can travel 200 to 300 miles in a day, and on arrival it is ready for action.

—Motorized Infantry Ground Exploitation Team, divisions and corps of cavalry to produce the greatest exploitation force yet devised.

c. The most effective reconnaissance is accomplished by motor plus horse. We should have horse reconnaissance groups with all infantry echelons from regiment to corps.

d. The strategic mobility of cavalry divisions should be amplified by the use of motor transport, consisting of truck-tractors with semi-trailers to transport cavalry divisions on long road marches.

e. The power of armored forces will be diminished because of the threat of anti-tank power and air power.

f. The relative power of cavalry will increase because of its power to evade destruction from the air by cross-country mobility and dispersion. Cavalry will be able to disperse, evade, continue on its mission, and fight.

g. The greatest handicap to cavalry development is the complete misconception of our people as to what American cavalry really is. Our army is sensitive to public opinion, even when based on ignorance.

h. The horse needs no favors. Hé asks only a square deal.

Food Inspection Changing

Veterinarians engaged in food inspection, full time or part time, keep informed with the changes in processing and packaging of food products brought about by the war. Space-saving concentration is the trend. Eggs are broken and frozen in cans or dried and reconstituted by thawing or adding the water lost in the process of desiccation. Skimmed milk is treated in the same way. A million gallons of orange juice is evaporated down to a sirupy liquid and restored to a delectable beverage by adding water, and boneless, frozen meat is packed in cartons of the shoebox type (Germany) to conserve shipping space. An understanding of these remarkable changes and their effect on food values is as much a part of animal-food inspection as eliminating the unfit carcasses, or parts thereof.

The bombing of Pearl Harbor (camouflaged with peace negotiations in Washington) was a stab at every American's heart.

Organized Veterinary Medicine in National Defense*

The American Veterinary Medical Association with its constituent state societies belongs to that class of organizations which in democratic countries have a quasi-public status. Although voluntarily maintained such organizations are, in effect, a part of the centralized governments of the nation and states. This is particularly true of such societies as the AMA and the AVMA. A large proportion of their members are publicly employed in one way or other, and they exist by virtue of vested rights.

Organized veterinary medicine in the United States analyzed as to personnel shows that its governmental contacts (national, state, municipal) are close and extensive. The federal and state forces engaged in animal-disease projects, the collegiate group, the municipal food inspectors, and the part-time (accredited) practitioners, not to mention those engaged in the small animal field, make up an assemblage classified in social science as a public administration organization.

The influence of this group of societies in the American form of government depends almost entirely upon the universality of membership and effort. What a "public administration organization" of the United States recommends within its sphere of activity, the government is apt to follow as the rule and guide of its public regulations, for within them are the officials as well as the master minds of the science they are all delegated to develop and exploit for the general welfare of the country. While the elements cementing such a society as the AVMA to the centralized governments may seem inapparent, the union is solid, and inseparable. The sooner we all take time out to get a clear understanding of these facts, the sooner a profession such as ours will accomplish its ends. Being only

loosely organized until perhaps the present time, a great deal of effort was lost in confusing details without stopping to study the general set-up under which we labor and which, needless to say, we can no more change than the American way of government itself. We are a government ruled by independent societies voluntarily maintained and may it ever remain so. To actually participate in our government, an American citizen must first participate in the work of the society to which he should belong. To stay out is equivalent to being without a voice in the country's affairs—without a country in fact. To professional men at least, voting for office seekers is but a minor privilege, compared with the right to participate in the shaping of one's occupation through the organizations our government permits and encourages. No country of history has furnished its people with a comparable personal privilege or opportunity.

RE NATIONAL DEFENSE

Organized veterinary medicine voluntarily maintains a service for the people. It is a service of considerable fundamental consequence in planning an invulnerable nation—a service that can be neglected only at the risk of bringing about the same tragic shortage of human food that has overtaken certain countries of Europe, granting that reports filtering through the censors are half true. Unfortunately, however, the veterinary service receives but scant attention in the gigantic national defense program of this hour. If the fault is not yours and mine, it at least may lie in the weakness of the societies, like ours, upon which the government looks for guidance in carrying out its national defense projects.

[This report is exhumed 12 months after it was read because it is prophetic and still applicable.]

*Excerpt from the report of the Special Legislative Committee, Illinois State Veterinary Medical Association, Springfield, Illinois, January 23-24, 1941.

Some Army Veterinary History

THE AMOUNT OF food inspected, and passed or rejected, for our quartermasters of the present time turns the mind to the history of our veterinary military service. Nearly 100 million pounds of food of animal origin were inspected by the veterinary officers during the past ten months, press dispatches declare. Of this poundage certain amounts were rejected (1) as unwholesome or (2) for not meeting the exact contract specifications. The benefits are two-edged. The government saves millions and the soldiers get wholesome food, perforce the majestic task of but a few specially trained officers, carried out in addition to planning and supervising the sanitary and medical care of the Army's mounts.

The importance of college training for army veterinary surgeons (as they were then called) to replace the old quacks and farriers was first recognized in 1879, when the War Department barred further employment of non-graduates for the mounted service. Unfortunately, the Quartermaster Department did not take the same step forward. It was not until a veterinary service was being formed for a military expedition overseas in 1917, when meat inspection for civilians had long since become a veritable religion in this country, that the sustenance department of the rapidly forming army saw the importance of avoiding a repetition of the embalmed beef scandal of Spanish-American War history. The result will forever reflect credit to the World War quartermaster general, for despite the rapid mobilization of a tremendous legion by our totally unprepared nations in 1917, the sustenance service of the gigantic effort not only came out victorious, but established the principal in military organization that now yields important dividends in money and morale. Were warranted complaints about tainted food added to the growlings of the military camps about this and that today, the sequel

would certainly be a great victory for the fifth column.

Moreover, in 1898, when the Army was organizing a small force for the unwise invasion of Spanish possessions, over 2 million dollars worth of horses and mules were purchased without competent veterinary inspection. The result was comparable to but less widely publicized than the indelible embalmed beef story. The procurement of hundreds of unfit animals and the sickening of soldiers from toxic meat rested heavily over the heads of the quartermasters, who had not followed the developments of food inspection and the wisdom of establishing such a service for the benefit of our small constabulary which folks called an army.

In 1916, when war seemed inevitable, Army veterinarians were granted commissioned rank (from second lieutenant to major), and the actual declaration of war by Congress led to the forming of a veterinary corps by the surgeon general, under whose command the newly commissioned veterinary officers had been placed. Meanwhile, the old quarrel between the quartermaster and the armed forces had died out. Cooperation replaced controversy, medical science replaced quackery. In the A. E. F. there was complete accord between the remount and veterinary services. The division, corps and army remount officers and veterinarians planned and worked together and that relation continued post-War. The relationship is finely expressed in the vast amount of service the veterinary officers render for the officers of food procurement and, needless to add, by the praise the quartermasters of 1942 are receiving for the quality of food they are furnishing to the soldier.

America faces an emergency. Every citizen is urged to assist to the utmost of his ability by buying Defense Savings Bonds and Stamps.

Of Interest to the Cavalry Arm

IN SPEAKING OF California, "playground" is not the right word in view of its utilitarian gifts to posterity. In sprouting from a land of missions toward America's utopia, the horse was king and horsemanship of the upper bracket was glorified. Long before the Rose Tournament, Santa Anita, Sheriff's Posse and Bing Crosby of its "southern empire," California had its Le-

importance of this subject. Slippery going and smooth shoes can immobilize a transport train or detachment of mounted soldiers. Moreover, the scarcity of horse-shoers is overcome to a considerable extent by the duration of sharpness in calked shoes and the longer intervals between shoeings. Shoes with a grip that soldiers, perhaps but half trained in shoeing, can tack on is not a trivial blessing in any march. On



Fig. 1. Horseshoe faced with borium at three points of the wearing surface.

land Stanford's, White Hat McCarthy's and Budd Doble's as champions of equine transportation. It is, therefore, not amazing that here was invented an improvement in horseshoeing that has been the dream of horsemen in all modern times: a lasting, nonslip horseshoe. The invention was first announced in veterinary literature in the May 1941 issue of the *JOURNAL* (p. 389) under the title, "A New Departure in Horseshoeing: Tube Borium."

The purpose of reviving the subject is the probable use of this invention on a large scale in coming military operations and the improvement on the original invention that has just been announced. The maker is the Stood Company at Whittier, Calif. (near Los Angeles). Veterinary officers who have had experience with military mounts on slippery ground need not be told of the

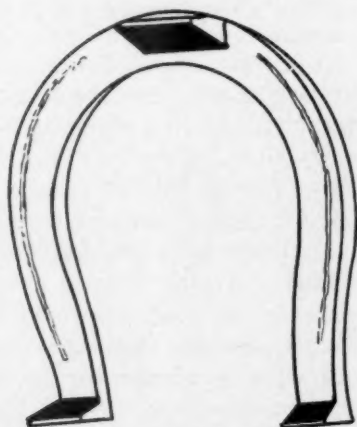


Fig. 2. Borium-faced heel and toe calks. The calks keep sharp by wearing of the softer metal to which the borium is fused.

icy ground, sharp shoes are an absolute necessity. Without them the marchers can go no further. The importance of sure footing for mounted men tells but a part of the story.



Fig. 3. Brazing borium into a shoe.

Food Inspection by the Veterinary Corps

Persons who would relieve the Veterinary Corps of food inspection on the ground that certain meats come to the soldiers already inspected by another agency would be more useful by leaving military matters to military men—in this case to the Surgeon General of the Army and his experts in the field of health. A great deal can happen to food after it is procured and expertly accepted. It's a long way from the

previous war, can be the difference between the life and death of our country's freedom. As a matter of fact, the work of the veterinary officers in food inspection, like that of the officers of the Sanitary Corps (both of which are directed by the Surgeon General) varies with environments chosen for strategical or tactical reasons regardless of their hygienic condition. Food provided to soldiers after the supervision of specially



Instruction in practical meat inspection by officers of the Veterinary Corps is given to all officers of the veterinary service (left) and "better food for soldiers through chemistry" (right) is given to them through the Army Veterinary School in Washington.

packing house to the rolling kitchen and moreover, the veterinary officers inspect a great many varieties of food other than refrigerated cuts of meat and in this worldwide war, the source of the food soldiers are to be fed may not be the well-regulated American packing house. The inclusion of milk in the army ration is another reason—a vital one—why the eternal vigilance over food as conducted under the regulations of the Medical Department should be enlarged, scientifically improved and rigorously enforced. The difference between the scientific selection and inspection of food for the American soldier and the old contract system which took lives by the score in a

trained inspectors of the Veterinary Corps is comparable to water supply, sewerage, housing, insect control *et al.* which receive the watchful and scientific supervision of the Sanitary Corps. There must be no change in these inspections for our soldiers—not now or ever. Within our own ranks any contrary view would be disloyal, unpatriotic, ill-advised, unfortunate, unbelievable.

Inflation is a form of taxation that takes no account of the ability to pay.—*President Roosevelt.* The prevention is buying Defense Stamps and Bonds.

Mustard Gas in Warfare

Gases as they affect horses and mules of armed forces in combat are described* in the April 1941 issue of *Veterinary Bulletin*.† The knowledge of tear gases, "sneezers," suffocative gases and blistering agents is discussed, the latter two at some length. Presumably, knowledge of the subject is brought up to date. In regard to the casualties from mustard gas, the author's treatment of the subject is not entirely in accord with the records of the American veterinary service of the World War — the last occasion for making extensive observations. As the author rightly states, "It [mustard gas] exerts its effects for several days as it slowly volatilizes."

The slow, dogged advances of the Western Front and the churned up terrain were a favorable situation for maximum damage from this vesicating agent and it was widely used. The duration (one to two days) of its effectiveness to do harm to horses is probably much longer—one to two weeks according to the records of 1918. The weather is obviously a factor in the process of volatilization, but as far as animals are concerned, the droplets rather than the gas they generate inflict the characteristic cutaneous damage. Among the large number of mustard-gas casualties in animals, pulmonary injury was extremely rare. Hence, unless the generators of this gas have been considerably modified in recent years, the gas mask would be of little use, even though these gadgets may have been improved to such an extent as to somehow overcome the physical difficulty of purifying the volumi-

nous air intake of horses, even horses at rest.

The damage done by the two types of vesicants used appeared to be markedly superficial. The second and third degree burns so commonly mentioned seemed to be due to secondary invaders for which the blistering action of the agents paved the way. As the World War grew older and experience increased, there were veterinary officers who contended that some of the

so-called ulcerative lymphangitis (Priez-Nocard infection), bane of the Western Front, originated from the epithelial damage inflicted by mustard-gas generators contained in the mud.

Moreover, in weighing the potentiality of gases in warfare, it might be well not to follow too closely the experi-

ences of the medical corps, for in the case of this vesicant at least, the medical and veterinary problems differ in many material respects. These heavier-than-air gases are scattered as generators, in droplet form. Since they are capable of resisting volatilization for several days or more and probably remain incorporated in mud as droplets for a much longer time, they create a distinctly veterinary problem.

This time we can afford to lose the peace. In the fight for freedom, milk and meat will take up the job where bombs and planes leave off. That job is America's.—R. M. Evans, AAA Administrator, USDA.

Secretary of Agriculture Claude Wickard tells farmers in a few words why adjustment of farm operations should be made, viz.: (1) It is their duty in national defense, and (2) it will pay them.



Extensive epidermal exfoliation from mustard gas, photographed by Lt. Col. Reuben Hilty, A.E.F., 1918.

*By Capt. Don L. Mace, Veterinary Corps, U. S. Army.

†*Veterinary Bulletin*, Supplement to the Army Medical Bulletin, xxxv (Apr. 1941), pp. 86-95.

The Control of Bovine Mastitis in the "Food for Freedom" Program*

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THE FEDERAL GOVERNMENT has asked the dairy farmer to increase milk production by 16 per cent during 1942 as a part of the "Food for Freedom" program. The Extension Service of the University of California is cautioning dairymen against an undue expansion of their herds at this time, and, instead, is suggesting that an endeavor be made for greater production through better management and feeding of the existing dairy cattle.

Included in a campaign should be the control of chronic mastitis caused by *Streptococcus agalactiae*. Data collected at the University of California reveal that, while a few herds in the state are free from this infection, in the majority of them between 25 and 75 per cent of the cows are infected.

Chronic mastitis is of considerable economic importance. It results in a decrease in both the quality and the quantity of the milk produced by the affected cows. Shaw and Beam¹ compared the production of infected quarters with corresponding opposite, but normal, quarters on 86 cows. They estimated a reduction of 22 per cent in milk and 24 per cent in fat due to the infection. Minett and Martin² have reported decreases in herd production due to mastitis varying from 10.8 to 19.5 per cent in three separate herds. It is obvious, therefore, that much of the increase in milk production requested by the federal government could be obtained by controlling mastitis.

During the past five years, extensive investigations of methods for the diagnosis,

control and treatment of mastitis have been carried on in selected California dairy herds. The knowledge gained has led to the conclusion that mastitis can be controlled, and even eradicated, from dairy herds with adequate methods for the detection, segregation and treatment.

1. *Diagnosis of the infection.*—The nature of chronic mastitis is such that its existence in individual cows is not at all times manifested by readily detectable symptoms. Frequently many months elapse between the establishment of the infection in a cow and the appearance of clinical symptoms of mastitis. However, *Str. agalactiae* is shed in the milk of the infected cow irrespective of whether visible symptoms of mastitis exist; thus, a control program should be based on the detection of the presence of *Str. agalactiae* rather than on the testing for evidence of clinical mastitis. The most accurate method of detecting infected cows is a detailed bacteriological study of the milk samples of the individual animals. This is expensive and time-consuming and, therefore, is impractical for routine testing of a large group of animals.

The several indirect tests for mastitis developed include the strip cup, thybromol, chloride and catalase tests, the leucocyte count, palpation of the milked-out udder for fibrosis, and the microscopic examination of stained smears of incubated milk for the presence of streptococci. The writer has made a careful study of these tests and has found them to vary considerably in efficiency as indicators of infection with *Str. agalactiae*. Except for the microscopic test for streptococci, all of the indirect tests for mastitis depend for a positive result upon the existence of sufficient tissue damage to give rise to an alteration in the

*Excerpt made from an address delivered before the California Veterinary Conference, Davis, January 6-8, 1942.

¹Shaw, A. O., and Beam, A. L. The effect of mastitis upon milk production. *Jour. Dairy Sci.*, xviii: 353-357 (1935).

²Minett, F. C., and Martin, W. J. Influence of mastitis and of *Brucella abortus* infection upon milk yield of cows. *Jour. Dairy Res.*, vii, (1936).

structure of the udder or the composition of its secretion. The indirect tests, therefore, often fail to detect latent and sub-clinical cases.

The microscopic examination of stained smears of milk, incubated overnight at 37 C., is an efficient test for the presence of streptococci. It is not possible by this test to distinguish between pathogenic and harmless streptococci. However, our investigations have revealed that the harmless streptococci do not persist for any great length of time in the bovine udder while infections with *Str. agalactiae* are often permanent. Thus, if a microscopic test for streptococci is made at monthly intervals on all lactating cows in a herd, the accumulated results will indicate the cows infected with pathogenic streptococci.

2. *Segregation of the infected cows.* *Str. agalactiae* is a parasite of the bovine udder which is not known to exist as a permanent inhabitant in any other tissue or organ and is unable to survive for any great length of time in the environment of the dairy farm. *Str. agalactiae* enters the udder through the teat canal and spreads from cow to cow primarily during the act of milking. By segregating the infected cows from the remainder of the herd and milking them last, the spread of the infection can be greatly retarded. Flies and contaminated corrals may play a minor rôle in the spread of the disease.

3. *Care of the infected cow.* After *Str. agalactiae* becomes well established in the udder, it usually remains there during the life of the animal unless removed by chemotherapy. The infected udder is sensitive to poor management and sudden environmental changes and responds to these conditions by a flare-up of the infection, which results in the production of a visibly abnormal secretion. Incomplete milking, exposure to inclement weather without the benefit of shelter, and perhaps a number of other physical factors, tend to aggravate the infection and thus increase the amount of tissue damage. If infected cows are properly cared for, they will produce more efficiently.

4. *Treatment of infected cows.* The statement that chronic mastitis is an incurable disease is no longer tenable. Recent work has indicated that several chemical agents are capable of removing *Str. agalactiae* from a high percentage of infected udders. Through specific treatment, many cows with chronic mastitis that would otherwise be sent to slaughter can be retained in the herd and are capable of producing efficiently. Udders damaged by infection may, after *Str. agalactiae* has been removed by specific treatment, revert more or less to a normal condition in subsequent lactations.

A PLAN FOR THE CONTROL OF CHRONIC MASTITIS

To control mastitis and eventually eradicate *Str. agalactiae* from a herd, it is necessary to:

- (1) Test the herd at frequent intervals for evidence of infection.
- (2) Segregate the infected cows and milk them last.
- (3) Treat the infected animals by specific chemotherapy. (Treatment during the dry period is recommended.)

The writer has determined that it is possible to train dairy personnel to make the microscopic test for mastitis. If the dairyman will provide himself with a microscope and accessory equipment for conducting this test and will appoint a responsible person to make a monthly test on all lactating cows, a sound basis will thereby be provided for segregation and treatment of the herd under the veterinarian's supervision.

In this plan, the burden of testing for mastitis is placed upon the dairyman. This will lead to greater interest in the program by the dairy personnel than would be obtained if the testing were done elsewhere. A monthly test of all lactating cows will indicate to the dairyman the effectiveness of his segregation program and also provide a sound basis for selection of cows for treatment by the veterinarian. After treatment, it is possible to ascertain whether or not a cure has been produced by use of the microscopic test.

Our Present Concepts of Viruses*

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FOLLOWING THE adaptation of the microscope to the diagnosis of bacterial disease, it was observed that there were many diseases, obviously contagious in character, the etiology of which could not be determined by this means or by cultivation on artificial mediums. It was later found that in such diseases the causative agents were capable of passing through filters which retained microbes of ordinary microscopic size and that the filtrates were capable of causing the respective diseases. Thus, an etiologic agent of this kind has been classed as an ultramicroscopic, or filtrable, virus and is now commonly referred to simply as a virus.

The importance of virus diseases in medicine is being recognized as of the greatest significance. At present there are approximately 30 virus diseases affecting man and 37 affecting animals, and new virus diseases are being recognized from time to time which continue to add to the problem of controlling this menace to human and animal health.

SIZE

Upon further studies it also has been disclosed that with the aid of a specially constructed microscope certain bodies can be recognized which were considered the causative agents of the respective diseases. Much credit in this particular investigation is due to Dr. Barnard of the National Institute for Medical Research of England, whose study and development of the ultramicroscope became a hobby with him. With the ultraviolet microscope, which he dis-

played at the Second International Congress for Microbiologists in London, in 1936, he pointed out in several specimens definite cell enclosures occurring in the various virus diseases and extracellular bodies, which he termed as the causative factors of the respective diseases and which, upon careful study of the slides and photomicrographs, show a variation in size and appearance as well.

The development of the electron microscope, with its tremendous magnifying power, might prove of material assistance in the clarification of the complexity and nature of the viruses. Although this marvelous apparatus is still in its infancy, it has already proved invaluable in its application in biologic and physical research. Its adaptability for virus investigations is, to say the least, very promising.

Further advancement in the study of the viruses was achieved through the ultrafilter membranes, developed by Elford of the National Institute for Medical Research of England. Through a method of impregnation he developed membranes of various porosities. It was shown that one type of virus would be retained by a filter of a definite porosity, whereas other viruses would pass through it, and that the size of the virus of various diseases varied between the size of protein molecules and that of the smallest of the microscopically visible microbes. Thus the comparative size of various viruses could be closely determined. It was proved, for instance, that the virus of foot-and-mouth disease is considerably smaller than the virus causing smallpox. By means of these filters, viruses may be differentiated within certain limits. It is thus possible to differentiate the viruses of foot-and-mouth disease from those of vesicular stomatitis.

*Technical address by the recipient of the Twelfth International Veterinary Congress Prize for 1941, presented at the seventy-eighth annual meeting of the AVMA, Indianapolis, Ind., August 11-15, 1941. [Dr. Eichhorn, director of the Animal Disease Station of the U. S. Bureau of Animal Industry, was selected for this award primarily because of his outstanding work, of international scope, in the field of virus-disease research.—Ed.]

CULTIVATION

All of the other earlier efforts to cultivate the viruses on artificial mediums failed. At one time Naguchi published on a method of cultivation of the rabies virus on a special medium in which at a certain strata under the surface a definite change in the medium was noticeable. Although reproduction of the disease with this material was successful, subsequent studies proved that the portion of the medium which Naguchi considered as the growth of the virus represented only an artefact and not a true growth. His successful transmission of the disease with this material also could be attributed to a continuous transplanting and subsequent dilution of the virus itself, which even in very, very minute quantities can reproduce the disease.

More recently, however, the cultivation of many of the viruses has been successfully accomplished upon living tissue or upon the membranes of chick embryos as well as in the embryo itself. Many of the viruses have thus been successfully cultivated and developed in a purer form than obtained from the tissues of man and animals affected with a virus disease. The fact has thus been established that viruses have the faculty of multiplying only in living cells, which is a point of differentiation between them and microorganisms, which can multiply on inert mediums.

NATURE

It has been generally conceded that the viruses represent living bodies, based on the assumption that virus diseases are readily transmissible. Even when the disease is produced in animals with very minute quantities of the infected parts, it apparently multiplies to such an extent that again from minute quantities of the material, reproduction of the disease is possible. More recently, however, with the aid of an ultracentrifuge developed by Wyckoff, it has been shown that it is possible to fractionize the virus-containing material. That is, with this centrifuge the various-size molecules can be separated in layers, and thereby it has been definitely established

that a certain layer of the centrifuged material containing the virus shows a definite molecular size and can thus be separated.

With the aid of these studies, Wyckoff has found that the molecules of the different viruses are of different sizes and that they represent a protein molecule, which, in its manifestations in the centrifuge tubes, does not differ from the other protein molecules. His sedimentation studies of the centrifuged material containing the virus show distinctly the various strata of the protein molecules and thereby make it possible to obtain the virus molecule in a pure form.

These investigations also have made possible the determination of the molecular weights of the viruses studied. Here again it has been proved that the viruses of the various diseases possess definite sizes and molecular weights.

The above-mentioned researches are of special importance because they lead to the assumption that the viruses as such are not definite living bodies, but more likely are inanimate protein molecules, produced in multiplying quantities by an abnormal metabolism of the "diseased" tissue cells, possibly as in the case with the catalytic enzymes. Unquestionably, great progress is being made in the study of viruses with the use of the ultracentrifuge and ultramicroscope, and aided by the cultivation of the viruses in living embryos and tissue elements, we may hope to obtain more data as to their nature. This might eventually lead to a more rational method of immunization and, incidentally, to the control of these diseases. We should not pass up the work of Stanley conducted with the mosaic virus of tobacco, which only strengthens the above assumption pertaining to the nature of the viruses. Stanley succeeded in obtaining the protein molecule, which he terms as the virus of the mosaic disease, in a crystalline form.

The success of Stanley in producing the mosaic virus of tobacco in crystalline form is not only of importance from an academic or purely scientific standpoint, but also for reasons on the theory of life, as some data

suggest the possibility of a transition between protein molecules and living cells. We are here confronted with the astounding assumption that a simple chemical molecule possesses the capability for self-multiplication, a property which until the present time has been attributed only to living organisms of a complicated structure. Whether the properties of the plant virus are identical with those of the animal virus is still questionable. The animal viruses appear to possess a more complicated structure and thus far the production of animal viruses in crystalline form has not been successful. However, it has been proved that they also represent uniform protein bodies as, for instance, the viruses of rabbit papilloma, pox, and foot-and-mouth disease. All of these very important conceptions are the result of coöperative work between chemists and biologists by the utilization of modern apparatus of up-to-date investigations. The research established that for the propagation of viral substances, nucleic acid is necessary. If the nucleic acid is removed, the development of virus disease is prevented. The biologic difference of the viral substance must be traced to the variance of the structure of the nuclein components. The structural determination of the tobacco mosaic virus furnished the basis for further research of the problem, which undoubtedly will be of material assistance for the practical control of virus diseases.

These studies also may lead to such fractionization of the virus which might result in a development of virus vaccines and the possibility of obtaining antigenic material, through such fractionization, without its being infective. This has been shown by the recent work of Dr. Fairbottom of England with the influenza virus, in which it has been proved that, with the ultracentrifuge, an inert fraction may be obtained which, though antigenic in its action, is not infective.

ADAPTATION

The adaptation of certain viruses to prolific multiplication in the developing chick embryo has resulted in the development of

a highly effective vaccine for the prevention of equine encephalomyelitis. Unfortunately, not all viruses can be adapted to growth in the chick embryo.

Aside from these newer conceptions, we can not entirely dissociate our minds from the possibility of an adaptation of the viruses to the various species of animals. As we well know, we have the so-called neurotropic, dermatotropic and viscerotropic viruses. While at first there was an inclination to classify the viruses in this manner, more recent investigations have shown that, though they may be of one type, they may revert to another type through repeated efforts of transmission. Thus Olitsky has shown that the dermatotropic vesicular stomatitis virus in guinea pigs can be developed into a neurotropic type. Of course, we also have evidence that many viruses may be of both or of even all three types.

This brings us to the phase where we may discuss the possibility of the adaptation of the viruses causing a certain definite disease in man or animal and the possibility of their becoming pathogenic to other species of animals for which they appeared to have an immunity. While there is no proof of such an adaptation, there are many indications that this is possible if we carefully consider the nature and symptom complex of various virus diseases in different species of animals as well as the histopathologic manifestations of different virus diseases.

Along this line it might be advisable to mention some of the diseases wherein such an adaptation may have been possible. Influenza of man and hogs may be considered first. In 1917 and 1918, we experienced a serious outbreak of human influenza throughout the world, and until that time so-called swine flu was unknown. Following the disease in man in Iowa, Dr. Koen observed a disease in hogs which was widely spread and resembled influenza in its manifestations, which, for want of a better name, he termed swine flu. Although the effort of isolating the causative agent resulted in the incrimination of various

microorganisms, the virus nature was not recognized until Dr. Shope studied the disease and proved this point. Subsequent comparative studies between the human and the swine influenza virus have established a certain relationship, and the possibility of the adaptation of the human influenza virus for swine can not be denied.

In the early studies of the human influenza virus, it was thought that only human beings and ferrets were susceptible. Upon repeated efforts of transmission, the virus also has proved pathogenic for mice and now it is possible to study the virus more thoroughly because it may be readily transmitted to mice, in which it causes a fatal pneumonia.

In 1934, Eichhorn and Pyle reported on the relationship of the virus of human influenza and canine distemper. The observations were made in connection with research conducted on ferrets with the influenza virus. While ferrets are highly susceptible to the human influenza virus, they survive the attack following a characteristic symptom complex. An accumulation of a considerable number of such recovered ferrets induced the investigators to utilize them in their routine testing of the virulence of the canine distemper virus. To their surprise, several of the ferrets failed to develop the typical disease and, in fact, while distemper in ferrets is invariably fatal, some resisted the infection. Subsequent controlled experiments have shown that the virus of influenza in man apparently induces an immunity in ferrets against the distemper virus in dogs. More recently Horsfall and Lenette, in their immunologic research on human influenza, established that ferrets injected with influenza vaccine failed to show a resistance against influenza; also, that ferrets injected with canine distemper virus showed no marked immunity against influenza, whereas when injected with a combination of the two they proved immune against the human influenza virus. For the present one can explain this phenomenon only on a theoretical basis, at least until research will disclose the true nature of viruses.

In 1938, encephalomyelitis occurred

among horses and mules in the United States to an alarming extent. It is estimated by some that 300,000 cases occurred during the year. In the original work of K. F. Meyer in California, the virus nature of this infection was established. Subsequent to the study of the virus, it was found that the disease occurring in the East differed somewhat in its behavior from the disease in the West, the eastern virus showing a greater virulence, the mortality being over 90 per cent, whereas the western virus caused a mortality of not over 40 to 50 per cent. In addition the investigations revealed that the two viruses are not identical on cross immunologic tests.

On the other hand, the clinical manifestations and transmissibility of the disease to monkeys and guinea pigs do not enable a differentiation of the two viruses. Furthermore, a similar condition in Europe, known as Borna's disease, and an infection occurring in South America have either been differentiated from our equine encephalomyelitis or identified as the same with one or the other of our strains. Although a study of the encephalomyelitis virus with the ultracentrifuge has established that the eastern strain of virus consists of a much smaller molecule than the western strain, it is difficult to conceive that the types of viruses have not changed their character and activity through some form of adaptation.

Another interesting observation that also might have some bearing on this contention was made at the Lederle Laboratories when, some years ago, attempts were made to produce an immune serum against poliomyelitis by the injection into horses of tissue virus from monkeys artificially infected. For a time the horses tolerated increasing injections of the monkey brain and spinal cord. Months after the initiation of this treatment, however, one after another of the horses developed a peculiar type of paralysis which might have been due to a virus infection, although the virus could not be demonstrated in the central nervous system. It is well known that horses have never been found susceptible to the poliomyelitis virus. While the virus

could not be demonstrated in the central nervous system, there is the possibility that the virus of poliomyelitis might have adapted itself under the conditions and caused the death of these animals.

No illustration of the adaptation of virus is more striking than the virus of pox. Many of our domestic animals are susceptible to pox infection. The pathologic manifestations of the disease are identical in practically all species of animals, yet the pathogenicity of the virus is typical for the different species, although in the case of cow pox a definite immunity is produced against human pox. Whether any degree of immunity might be produced in the various species with the heterologous virus is very doubtful. Nevertheless, the adaptation of the virus for the various species of animals from an original type might have been possible.

We may similarly accept such a possibility with the virus of foot-and-mouth disease and vesicular stomatitis. We may recall that at the time of the original outbreak of foot-and-mouth disease in the United States, the diagnosis was based upon the transmissibility of the disease to other calves and the failure of transmitting the infection to laboratory test animals and horses constituted a definite differential diagnosis. The extensive appearance of vesicular stomatitis in horses in 1914 in Nebraska and other points enabled authorities to study this infection. The manifestations in the mouth were typical of the lesions of foot-and-mouth disease. Still, the presence of the disease in horses afforded a differentiation.

Subsequent studies of the occurrence of this disease in cattle and hogs made a differential diagnosis more difficult and, from a clinical point of view, impossible. It also has been established that vesicular stomatitis virus as well as the foot-and-mouth disease virus can be readily transmitted by artificial inoculations of the pads of the foot of guinea pigs, which, during the early studies of foot-and-mouth disease, was deemed impossible. As a matter of fact, at the present time at least three dif-

ferent types of foot-and-mouth disease virus, which differ from each other cross immunologically, are being distinguished. Thus we are confronted with the viruses causing identical manifestations in practically all species of animals, yet differing immunologically. Here again the possibility of the adaptation of the virus may play an important part in its manifestation and infectivity.

Another disease in which the adaptation of the virus can be assumed is rabies. The manifestations of the disease in dogs are generally known and the virus causing the infection in this species is known as street virus. After passage through many series of rabbits, Pasteur increased the pathogenic action of the virus for these animals and reduced its virulence for dogs. Thus, the street virus which originally produced the disease in rabbits in 11 to 14 days has been fixed for this species so that it induces the disease in six days and shows a corresponding reduction of virulence for man and other animals. As a matter of fact, human beings or animals tolerate the unaltered fixed-virus injections without ill effects, which, in turn, produces an immunity against street virus. The safety of such unaltered fixed virus for man and animals is best proved by the fact that various dilutions of such material are being used for immunization against the street virus.

Another disease simulating and often mistaken for rabies is infectious bulbar paralysis — a virus affection of animals manifesting itself by nervous symptoms and subsequent paralysis. This disease, which affects various species of animals, has proved highly pathogenic for cattle and hogs. The early efforts of transmitting the virus to guinea pigs failed. Upon repeated attempts, however, in the biologic laboratories of Mexico City, the virus was transmitted from guinea pig to guinea pig in more than 100 passages, having been definitely fixed for these test animals. The pathogenicity of this virus also differs for the various animals. Shope recognized the existence of the disease in the United

States in pigs and cattle. It occurs in a mild form from which the animals readily recover. In other countries, on the other hand, as in Holland and Hungary, this virus has been known to cause considerable losses in young pigs.

One could cite many other similar instances wherein the possibility of an adaptation of the viruses might be considered. However, it will require further painstaking investigations to establish under what conditions such adaptation might be possible, if it takes place. We might hope for more enlightenment on viruses in general with the aid of the ultracentrifuge, the ultramicroscope and artificial cultivation in embryos or tissues whereby it may be possible to obtain the viruses in a more concentrated and purer form. The ultracentrifuge and electron microscope are, unquestionably, a great advance in enabling investigators to study certain protein molecules and their nature, which they now consider the true viruses, and possibly establish under what conditions they propagate and become destructive disease agents.

In the study of virus diseases, very often it is impossible to determine any connection of exposure and one is almost inclined to accept the possibility of a spontaneous development of the disease. Whether these protein molecules might not remain dormant under certain conditions in certain tissue cells and upon some provocation become activated is a question for scientists to establish. Nevertheless, the progress made in the past several years is far-reaching and it is hoped that, with our more recent conception of their nature and the available armamentarium, their mystification will be clarified and the doors opened for a rational control procedure.

Leprosy takes about 20 lives a year in the United States.

"What adults eat now will affect adult nutrition in 1961" is the headline in *Science News Letter* of November 1.

New (?) Diseases

When another of the microscopic enemies of higher life is captured, isolated and classified, it is often signalized erroneously as a new organism. Only its discovery and its previously unrecognized tricks are "new." There is no proof that the microbe itself did not exist since Creation.

In searching the pages of history for facts about the antiquity of the diseases of this period, Leclainche in his *Histoire de la Médecine Vétérinaire* was not sure that any of the ancient plagues of man and animals has ever disappeared or that new ones have arrived. Although some of the microbial life could have vanished as completely as the huge plants and beasts of the prehistoric ages through ecologic changes, who is qualified to announce that new ones have been created?

Within the range of the unaided eye, there hasn't been much creating since Genesis. And apparently that goes for microbes, too. Light, land, fish, fowls, snakes, worms and man himself were made in six days (=eras), and as far as man knows in this *anno domini* 1941, "there is nothing new under the sun." The factory shut down on the seventh day and was never opened again.

"Sinews of War"

A member of the British Parliament—Mr. D. C. Evans—has pointed out that organizing for the production of a variety of food valued at £250,000,000 a year by British farmers is the gargantuan task of the Minister of Agriculture. These foods, Mr. Evans reminded his audience, are sinews of war just as much as the products of the munition works.—*From The Veterinary Record*.

The parasites of plants which are controlled to a considerable extent by the use of insecticides present problems of great significance in food production. Like the diseases of farm animals, unless successfully fought, increasing food production would not be possible.

Some Practical Phases of Sheep Practice and Sheep Husbandry*

T. P. CRISPELL, D.V.M.

Parsons, Kansas

THIS PAPER includes simple conditions and their treatments, with which many of you are already acquainted but to those who now find this branch of practice developing, it may perhaps be helpful.

Sheep have many ailments, habits, and needs peculiar to them. I speak not as a veterinarian dealing with large bands, but from my personal experiences in raising and feeding my own sheep, and as one who deals with small farm flocks where patients are brought to the hospital by truck or in the back seat of the pleasure car. Many of my clients' problems are discussed in my office without seeing the patient.

EARLY BREEDING OF EWES

Early lambs are desired by all owners. The following practices will prove helpful for early breeding: fresh, lush pastures, adding some grain to the ration, early weaning, and not allowing the ewes to carry too much fat, especially the kind produced by corn feeding. A ewe must have her body "cooled" out before she will conceive.

BLOAT

Bloating on native grasses has never been a serious problem with us, but occasionally an owner will have a surge of flatulence in his flock. It occurs as a rule on lush pastures. Alfalfa, of course, is not trustworthy. There is much less bloating in bands not placed in dry lots at night, as a fast longer than normal seems to encourage gorging. Treatment consists of relieving the gas with a small rubber hose, and then pouring in, by attaching a funnel, the following mixture: $\frac{1}{2}$ to 1 oz. of turpentine, $\frac{1}{2}$ oz. of oil of cajeput, and 1 pt. of mineral oil. The use of the trocar or rumenotomy operation should be a last resort.

BUCKS RUNNING WITH FLOCK

Ewes from which lambs are weaned in April and May will sometimes breed immediately if their condition is good and the weather cool. This should not be allowed as the offspring will be "off season." During the breeding season, if two bucks are used, one should be kept up each day, or if using one buck on a sizable band he should be confined in the day time in a cool shed and allowed to run loose with the flock at night. Unless this precaution is taken they will frequently wear themselves out in the midday heat of late summer or early autumn.

CORYZA

Coryza or simple colds frequently occur in our native sheep. Even though the discharge from both nostrils is oftentimes profuse, it is a harmless condition that rights itself in a few days. The causes are: getting saturated with rain or snow, doors blowing shut, leaving some of the flock outside exposed to the elements, cold rains on early shorn flocks, too tight housing, *Oestrus ovis* infection. Treatment may not be necessary, but pine tar placed on the nostrils, pine oil sprays, proper housing and dry bedding, are helpful. Plenty of fresh air should be allowed.

CASTRATION

In our warm climate, castration is not economically sound. Tetanus claims too high a toll. The Burdizzo pincer, if properly used, is 98 per cent effective, but we do not urge its use if the lambs weigh 60-70 lbs. and are fat and marketable. Far better to take the "buck dock" than suffer the "shrink" from operating and the necessity of keeping them on the farm for an extra six weeks until the testicles atrophy. The ideal age for the use of the pincer is about

30 days. It works as well on mature bucks as upon lambs, excepting that they swell more and the testicles are slower in reducing.

DOCKING

Tails are docked as soon as possible after birth, using the Burdizzo pincer and scissor method, or heated pincers. Hemorrhage controls itself. Aged ewes are docked in like manner, excepting that the artery is pulled as in cattle dehorning and tetanus antitoxin is administered. Fly repellent ointments are used when needed. Ewes and lambs freshly docked should be barred from dusty, dirty sheds for at least one-half day to avoid infections, especially tetanus.

EXERCISE

Exercise must be plentiful winter and summer. Wheat, rye or barley pastures solve this problem readily, excepting in icy weather when sheep oftentimes must be forcibly driven from their sheds or their food placed some distance from farm buildings. Under-exercised sheep are prone to the ravishes of all ailments no matter how well cared for otherwise.

EVERSIONS OF THE UTERUS

Eversion of the uterus following lambing occurs occasionally. This condition is handled as in the bovine patient, but is more frequently fatal. Preparturient eversion of the vagina is very common. The conformation and physical condition of ewes evidently predisposes to this condition. The early symptom is the prolapse of a small portion of the vagina when the patient is lying down that disappears upon arising. Later, it does not replace itself when the animal stands. It becomes edematous and produces severe straining and loss of appetite. In time, the everted tissues become thickened, leathery and contaminated. The patient loses its appetite and later becomes paralyzed in the hind quarters. Treatment must be early to be successful, but when treated at once the response is quite gratifying.

Treatment.—The animal is restrained on foot if it can stand. The hind parts are

uplifted. The tissues are cleansed with a warm, mild antiseptic solution, the everted tissues are replaced, and three sutures are placed deep in the vulva, using No. 14 twisted silk doubled, or umbilical tape. Sufficient space is allowed ventrally for urination. Ointments to soften the tissues and to repel flies are applied externally, then the animal is turned loose with the flock. The more exercise she is given by following her mates, the better she will do. If odors arise and purulent discharges appear, irrigate lightly with warm salt water or a solution of permanganate of potash daily. The only precaution that is now necessary is to watch closely when this animal is ready to lamb as the sutures must be cut at this time to save the offspring. A careful owner will have no trouble, but if the caretaker is not present at parturition, the only damage resulting would be the loss of the young. If these eversions are neglected, a severe inflammation is set up in the vagina after replacement and suturing. Frequently adhesions form. This, of course, hinders the lambing and sometimes if the vagina be too severely constricted, the outcome of parturition may be fatal. The slightest eversion should be considered serious.

FOOT ROT

This serious condition is rarely seen in our locality in bands of sheep as compared with herds of cattle, probably due to the sheep's aversion for wet footing of any kind, whereas cattle oftentimes stand in deep mud for weeks at a time. When this condition is found in sheep it generally occurs when housed in sheds and pens with leaky roofs and an accumulation of manure. Individuals are treated as follows: Isolation, paring away of necrotic tissues and liberal usage of butter of antimony. Good results have occurred with daily dipping in a 1-40 coal tar preparation and then furnishing strictly dry footing during the entire course of the treatment.

KETOSIS (LAMBING PARALYSIS)

Much has been said of this condition and a great deal of investigational work

done, but there are still many unknowns concerning it. As to causes, faulty diets, underexercising, feed deficiencies, have been mentioned. In practice one will find bands wherein any of the above mentioned causative factors will fit. In other bands where the setup apparently is ideal and all causes mentioned above have been eliminated, still the disease exists. Underexercise to me is the outstanding cause. A laxative diet with some carbohydrate is helpful. The simple mineral elements should be provided. More important is the fact that ewes in advanced pregnancy must have adequate exercise. Oftentimes we force it upon them, especially in inclement weather. Too heavy feeding too handily placed will not promote stirring about. Treatment is not highly successful, but one must keep trying because someone will eventually find one line of treatment far better than the others. Laxatives, chloral hydrate, calcium gluconate and glucose all have been used with fair to poor results. Laxatives and chloral hydrate seem to be the best, using them as follows: Administer 1 qt. of mineral oil followed with 2 dr. of chloral as the initial dose, then give 2 dr. doses of chloral and mineral oil twice daily. Those in profound slumber practically all die. I have found yellow corn, blackstrap molasses, or both to be the best winter grain ration for the average farm flock, being careful to gradually eliminate the corn following lambing in order that the ewe will not be carrying too much fat when the lamb is weaned.

MATING

Many of our clients owning grade flocks want to mate with a purebred ram to secure larger, mutton type lambs, not caring so much for the wool decrease. Therefore, they choose a Hampshire ram but this is a troublesome cross as dystocias are too frequent. I advise crossing native ewes with the Shropshire. Such a cross reduces lambing losses and still produces a good type of lamb for mutton purposes.

ORPHANS

Orphans are of two types: Those disowned by the mother and those whose mother is dead. Restraining the wild, ill-natured ewe a few times will oftentimes bring desired results. Always try each teat for the removal of the caseous material that frequently obstructs them, as many lambs oftentimes starve on that account and also many half udders are ruined. Orphans are easy to rear, but not economically. If they can be cared for by children or housewives, the practice is quite successful and they will appreciate the spending money gained therefrom. Use rich milk undiluted for their food; feed regularly from clean containers commencing with small amounts. Use 2-oz. doses of castor oil when necessary to replace the natural meconium.

PARASITES

Ectoparasites are lice, ticks, maggots and the scabies mite. Lice and ticks are handled easily with commercial coal-tar preparations at 10- to 14 day intervals in the spring after shearing. Generally two applications are sufficient. Maggots occur in rather warm, damp weather in the spring as a result of not "tagging" the ewes, as when feeding upon lush pastures the bowel content becomes loose and the soiled wool becomes fly blown. The result is a loss of wool and sometimes the host. Treatment consists of clipping the wool liberally over and around the affected area, then applying commercial dip in a 1 to 40 solution with an oil can. This condition serves as a warning to shear the entire band whether one considers the condition of the wool and the weather conditions satisfactory or not. Scabies is manifested by loss of wool and flesh, itching, uneasiness, and biting parts of the body, especially the axilla. If suspicious of scabies, examine the wool in the axillary space or in the thoracic region and if it presents a washed appearance your suspicions are probably correct. In Kansas, if diagnosed positively by the practicing veterinarian, or are sufficiently suspicious, the livestock sanitary commissioner's vet-

erinarians will handle the cases officially. Such bands are quarantined until entirely cleaned up. The treatment consists of removing the wool, if long, and treating with the official lime and sulfur solution.

Endoparasites.—Of these we deal with the stomach worm, tapeworm, grubs and nodular worms, their importance being in the order named. The stomach worm (*Haemonchus contortus*) is, of course, our constant trouble maker.

• Control measures are: pasture rotation, the use of suitable parasiticides at stated intervals, and the "tagging" of ewes in the spring before lambing. The most commonly used treatments are: phenothiazine, a one per cent copper sulfate solution, copper sulfate and nicotine sulfate solution, tablets or capsules composed of copper sulfate, nicotine sulfate and kamala, and mixtures of tobacco dust, copper sulfate, calcium carbonate, salt, etc. The flock is allowed to lick these at will.

I regard phenothiazine the preferred treatment. I use and dispense a commercial product containing phenothiazine in a suitable vehicle so that it is rendered liquid. This product is not bulky and handles nicely. It is administered by tube in doses from $\frac{1}{2}$ to 2 oz., depending upon the size of the animal. A 12-hour fast is preferable. Treatment is repeated at 10- to 14-day intervals. The ewes are given, under ordinary conditions, two or three treatments in the spring and two in late summer or early fall prior to the breeding season. Sometimes two or three treatments are sufficient. In other groups, five or six treatments are needed. It is often necessary to commence the treatment of lambs before they are large enough to pass a tube. In such instances, I give a commercial tablet with the balling gun. Pills or compressed tablets are much safer than capsules. Capsules, when improperly lubricated, or half wet, are sticky and will remain in the throat and frequently produce sloughing, whereas a pill or tablet will rapidly disintegrate and rarely damages the tissues. Tapeworms don't cause as much trouble, but when necessary are treated best with the kamala nicotine tablet. The *Oesophagostomum co-*

lumbianum producer of nodular disease is apparently becoming less frequent in our community year by year. Phenothiazine is supposedly an effective treatment for this condition.

Liver flukes are a minor factor with us. Grub in the head (*Oestrus ovis*) differs from simple coryza in that the patient is more severely disturbed and frequently the outcome is fatal. The nasal discharge is often hemorrhagic and the affected animal is off feed, stamps the fore feet and keeps backing up, oftentimes gazing skyward. A fairly successful treatment consists of using a mixture of turpentine, oil of cajeput and oil of eucalyptus, equal parts. The patient is placed on an incline of baled hay or boards, head downward at an angle of 45 degrees. The head is then turned with the hands so that the nostrils are nearest the operator. This places the frontal sinuses at the lowermost point, and prevents the drug from entering the respiratory tract. One teaspoonful of the mixture is placed in each nostril. The head is shaken several times to and fro, then held for about 30 seconds to allow the liquids to penetrate the deeper parts. The patient is then urged to walk. She will cough and blow a few times, but very few die from the effects of inhalation. Repeat this treatment every other day. Trephining is not practical. Preventive measures such as darkened sheds, pine tar on the nostrils and salt boxes are quite practical.

PASTURES

Pastures can be ruined or benefited by a flock of sheep. If many are kept and allowed to run over the entire pasture, in time the good grasses will be replaced by wire grass and bare spots, but if properly cross fenced, pasture rotation practiced, and the mower used, the pastures will be made to produce a maximum amount of forage and parasites will also be reduced to a low ebb.

RETAINED PLACENTA

Frequently owners consult or bring to us a ewe with the placental membranes retained 24 hours following lambing. I have

removed them manually as in cows if the ewe is large, but this is not a practical procedure as too many ewes are injured. My treatment consists of administering one-dram doses of fluid extract of ergot three times daily in a small amount of water as a drench. It is generally not necessary to use more than six doses. Pituitary extract in 3 to 5 cc. doses has value.

THE EFFECTS OF TEMPERATURE

I have never seen the weather cold enough to affect adult sheep if they were dry. Heat bothers them, of course, but they tolerate any degree in our country if given an open shed through which the air circulates. Baby lambs will freeze to death in open sheds at a temperature from zero to 15 below. Their noses, lips, ears and feet freeze.

One should not attempt to feed lambs commercially during the hot summer months. Good pastures to graze upon at night and a shed for the daylight hours will bring them through the hot spell much cheaper. Then in the fall their appetites will develop and a profit can be made.

WATER

The water supply should be available and unpolluted. Sheep drink but a small amount each time and probably drink as often as a cow does during the summer months, but in winter very little water is consumed. They go for long intervals without drinking and apparently unharmed.

In icy weather, cinders, sawdust or salt may be placed on their pathways to insure sound footing. Sheep detest slippery surfaces. They also dislike walking through water or mud for either food or drink.

COMMENT

In conclusion I must state that practicing veterinarians can not afford to overlook at least the rudiments of sheep ailments and husbandry. Lack of knowledge or interest in this branch of general practice is disastrous to veterinary practice in general and is the "missing link" of an otherwise strong chain.

We need not be experts in any branch

of general practice, but we should be familiar with all lines of practice. Sheep rank high numerically and monetarily in our national livestock assets now more than ever before. They and their products constitute an important part of our national defense. In the type of practice which I have described, each case presented or each consultation by telephone or in the office does not necessarily constitute a profit, but in the end it increases the usefulness of your work and your standing with the livestock industry in your community. Therefore, I urge you to become better acquainted with sheep. If necessary and if possible, own and personally handle a few yourself. You will gain therefrom experiences that, coupled with your technical knowledge, will place you far above your otherwise well informed clients or those individuals trained along general agricultural lines.

The extension service is what its name expresses—extension of the educational system. Police work is not a part of its stated duties.

The superior type of hog is the intermediate type weighing from 200 to 235 pounds. Such hogs are able to carry additional weight if a heavier type is desired.—*John R. Mohler.*

In all living things, the fight for existence is mainly the fight for food. Plants send out long roots in search of food and moisture. Some animals store up food for the winter, others conserve food by taking a long sleep (hibernation). Men go to war to satisfy the cravings of the stomach.

From the frontier of prehistory up to the present period, food animals transported on the hoof were herded along for provisioning armies. The armies on the battle fronts of World War I had their cattle herds as the source of beef, and the ships of the Spanish armada came to Cuba in 1898 with cattle in their holds.

Diseases of Feeder Cattle*

A. H. SCHMIDT, D.V.M.

Triumph, Minn.

THE DEMAND for veterinary services in feeder cattle is probably the smallest per head of any livestock we attend. However, where feeding of cattle is conducted there are more cattle per farm than in a dairy section. This somewhat compensates for the small return per head.

The business of feeding cattle is more or less a gamble. Farmers in this business must possess a little gambling blood in order to face the ups and downs of the game. This type of person makes a fine client. He is generally quite tolerant, and if your treatment and care of his stock does not bring about the best results, he is not so apt to hold it against you.

In working for these clients, I try to remember that the final profit for them on a herd of steers must not be overlooked. Quite often it is more profitable for the owner to market a steer or a herd than it is to treat them for some minor ailment. This is particularly true when the cattle are carrying considerable flesh. Whenever I feel that the cost of treatment, or as is often the case a loss of flesh, will leave less final profit than immediate slaughter, I do not hesitate to advise the owner to ship. The loss is mine financially at the time, but the good will of the owner will compensate for it in the future. There are, however, many ailments which make the animal unmarketable until the condition is corrected; also there are many instances in which treatment will increase the final profit.

SHIPPING FEVER

One of the most common diseases encountered in a herd of feeders is shipping fever. Cattle rounded up in the West, take a long train ride, pass through one or more public stockyards, or perhaps several

community sales, with irregular feeding and watering, get a truck ride or two and therefore arrive on the farm weak and exhausted. Often they have a nasal discharge more or less cough and sometimes show evidence of diarrhea. If these symptoms are not present, they may show up in a few days. If you or I went through the same ordeals we would present about the same picture. This is the condition we call shipping fever, mixed infection, influenza, stockyards fever, and sometimes hemorrhagic septicemia. If the animals are naturally rugged, they soon overcome this condition with good care and shelter. If they are only slightly sick, I do not attempt to treat them individually. I like to place them in a good shelter, without draft, but with plenty fresh air, and feed a light ration of upland hay, oat straw, or whatever is available in that line. They should have fresh water before them at all times. I feel that fighting these animals to give them some medicine often does more harm than good. Of course, an animal that is quite sick needs attention, and at present I am favoring sulfanilamide in doses of 500 to 1,000 grains a day given at four hour intervals and continued for only two days, at which time I like to see the patients again. I am getting excellent results from this drug. It aborts many cases if used early. Its value is doubtful in cases of long standing, when the patient is weak. Such cases need stimulants, and I prefer dextrose, intravenously, in doses of 500 to 1,000 cc. of a 50 per cent solution, given twice daily in very weak animals or daily in others. I sometimes add calcium gluconate to the dextrose, also using 500 cc. 20 per cent solution at a time. Sulfanilamide is costly, so I quite often use an hydrochloric acid solution (1-1,500) in doses of 100 to 250 cc., intravenously, depending on the weight of the patient.

I occasionally use mixed bacterins in 10

*Read before the Section on General Practice, at the seventy-seventh annual meeting of the AVMA, Washington, D. C., August 26-30, 1940.

to 20 cc. doses, and give a double one the third day, but I have little faith in hemorrhagic septicemia or mixed bacterin as a preventive or curative treatment. I never advocate vaccination of the entire herd unless the owner insists. I do not like to have a client come back later, and ask me why the well animals that were vaccinated, later got sick. If pneumonia develops, I like to have an old fashioned mustard plaster applied, but good nursing is necessary. Sulfanilamide is helpful and stimulants are indicated. When I began to practice, I used to have a lot of hemorrhagic septicemia in cattle that were shipped into the territory, and in cattle on pasture, and in feedlots. As I grew older and practiced longer, I found less and less hemorrhagic septicemia, and of late years I do not recognize it as a disease in feeder cattle. I do not think that conditions are changing, rather my view point on this disease has changed, or is at fault. However, there is such a disease and if you find it in a herd, vaccinate with the bacterin and treat the sick with serum, but follow up with good nursing. As I have not used this serum in the last ten years, I can't state how much serum to use, nor how often it should be administered.

BLACKLEG

Blackleg is encountered occasionally in a feedlot, although most feeders are vaccinated on the range. The disease is easily recognized and the treatment is well known. However, in well-finished cattle, the clinical symptoms are often hidden. You may find a sluggish animal with a raised temperature, or sometimes a slight lameness, but the crepitating swellings are missing. Post-mortem examination will generally reveal the dark infiltrated tissue somewhere in the body. On one occasion the only lesion was found in lung tissue and the laboratory findings confirmed the diagnosis. A little caution in fat cattle is advisable.

ACTINOMYCOSIS

Actinomycosis seems to pop up in feeding lots frequently. Quite often a neglected case is allowed to spread infection in a lot. As time goes on different animals in the lot will show infection manifested by growths around the head or neck, wooden tongue or heavy breathing. The treatment with sodium iodide, intravenously, is the most practical method. I use 45 Gm. ($= 1\frac{1}{2}$ oz.) in 250 to 300 cc. of water. Occasionally this treatment must be repeated after about six weeks. Where the infection has become more or less general in a lot, iodine in some form should be given in the feed or salt. An organic iodine, sold under different trade names, is very effective for oral treatment. I have found it more effective than either sodium or potassium iodide orally. If a lesion is quite far advanced it should be lanced and cauterized and the intravenous treatment given. Such cases will often clear up without further attention. I cauterize to prevent spread of the infection from the discharge and also to form a scab or crust in the opening which will later slough out and leave a nice surface of regenerative tissue. This method often eliminates the after care, which is desirable in a feedlot. I use antimony chloride for this purpose.

FOOT ROT

Foot rot need not be described in detail as you are all familiar with it. We get this condition in the feedlot and also in pasture. It is most common during the middle of the summer. The potholes at that time are getting filthy. There is not sufficient rain to wash and cleanse these places and the animals like to stand in these holes to cool off and help ward off flies. To combat this condition, I try to get the feedlot drained if it can not be changed. In a pasture, the holes should be fenced off, if possible. For mass treatment, I use copper sulfate and lime, about 5 lb. of copper mixed with 100 lb. of lime. I have this spread around the salt licks, using about 200 to 400 lb. around each lick, or if there is a gate that the animals have to

Buy Defense Bonds

travel through to get water, I have a framework of 2 x 4's or similar material, about ten feet long and three or four feet wide. This is placed in the gate or entrance and the gate narrowed down to the width of this frame. This frame is filled with the mixture, so the cattle have to walk through it. If in a feedlot I use the same idea, placing the frame in a doorway or entrance, through which the cattle must pass frequently. This arrangement is less bothersome than a copper sulfate bath. The cost is more than a footbath arrangement, but I find that the client is more willing to follow my suggestion when there is less continuous work involved. In preparing the mixture I have the lime poured in first and the copper sulfate scattered on top and roughly raked in with a garden rake. This treatment will heal and clear up many of the minor infections.

The more severe infections must be cleaned up and dressed. After casting and securely restraining the patient, I remove all necrotic tissue, cauterize the wound with butter of antimony, bandage with an iodine pack and allow the bandage to remain until it wears off. One treatment is usually sufficient and after treatment is eliminated. At times I add pine tar to the pack as it helps to coat the wound. If the infection has entered the deeper tissues, involving the synovial sheaths or joints, it is difficult to establish healing, and then that part of the foot must be removed above the seat of infection. For this I find the fetotome, or an obstetrical saw, a convenient instrument. I place the toe into the loop, hold the tube against the area through which I want to saw. The direction is easily controlled, and the member easily removed. I soak the wound with iodine, pack with iodoform and bandage tightly with a liberal amount of bandage material. This bandage can remain until healing is well established. Rebandaging may be necessary at infrequent intervals.

UNDERNOURISHED CATTLE

Cattle, raised during unfavorable years, such as the dry spells in the West the last

few years, often lack mineral balance and when brought into the feedlot they do not make a profitable gain unless this condition is recognized and corrected by proper feeding. Too often the cattle feeder wants to make a cheap, fast gain by feeding corn, corn silage, and a roughage of corn fodder or straw. Such a practice is especially disastrous for calves. If the soil from which these feeds are grown happens to be low in the same mineral that the animals lack there will be trouble in a short time. Calcium and phosphorus are the minerals mostly concerned. In calcium deficiency the animals walk with a stiff gait and back arched, and may knuckle over. Some joints may be swollen and as the case advances they may refuse to walk or stand. Occasionally, after lying around a few days, one may find sores on the involved joints, similar in appearance to the joints of colts suffering with navel ill.

Calcium deficiency occasionally causes a nervous condition. An animal may suddenly start bawling, walk with a stiff or staggering gait, the head thrown up, drooling from the mouth and die quite suddenly. A postmortem examination in the nervous type may reveal conditions simulating some infectious disease, due to the hemorrhages in the brain, the heart or some of the other organs. Treatment consists of intravenous injections of calcium gluconate. This should be followed with a change in feeding. Add a good, green, cured hay, restrict the corn, eliminate silage for a period, and add an easily assimilated form of calcium. Yeast or cod liver oil should be added in winter, or where animals are kept under cover, which is done, sometimes, to protect them from flies, or to develop a glossy coat in the case of show animals.

Soy bean meal is being used more every year in the feedlots, and when this meal is used, calcium should be added to the rations. The phosphorus ratio in soy bean is very high, causing a calcium deficiency in the animal. In correcting a calcium fault, phosphorus must not be overlooked, as one depends upon the other.

There are some areas that are quite de-

cient in phosphorus. Steers fattened in such areas, but coming from a range with adequate phosphorus, may not show up a deficiency during the fattening period. But, animals raised in this area will be rough coated, poorly developed, and will not fatten readily until the condition is corrected. Chewing of wood and bone is generally evidenced in these cases. The long range treatment of all mineral deficiencies should be through the soil. It is the most economical for the farmer, for it improves his crops at the same time. In general, it is always good advice to insist that fattening cattle get some sun-cured legume hay, and if a mineral is needed or desired, a mixture of bonemeal, lime and salt will take care of the requirements in most cases.

Speaking of salt, all cattle should have loose salt available constantly. An animal can not get sufficient salt from the hard pressed blocks that are on the market today. Plenty of salt aids digestion and improves the quality of meat. An observing butcher can tell, when dressing a carcass, whether the animal has had free access to salt. The carcass is more mellow to the touch, as he would put it.

We also have digestive disturbances from heavy feeding such as bloating, diarrhea, founder and impactions. In the treatment of these I have nothing new to offer. The stomach tube comes in handy for most of these cases. If a bloat, the gas can quite often be removed by inserting the tube, pumping a little water or blowing into the tube occasionally to remove obstructions. If the gas can not be removed, I try antiferments such as aromatic spirits, ammonia, formalin, turpentine or any prepared antiferments. If the bloating is severe, of course, the trocar must be used. If I feel that I have time, I try a horse trocar first; often the bloat can be relieved nicely with it; the wound heals quickly and the feeding is not disturbed.

I have been using mineral oil, lately, for impactions, and other digestive disturbances, and believe that my results are better. I use one to two gallons at a dose. I believe the animal comes back to feeding

quicker than when salines are used. However, I do not always use oil as the treatment is not cheap. Reeks capsules are useful and can be easily given to feeders. For after treatment, I use Udall's mixture, composed of strychnine, arsenic, and hydrochloric acid. The stock mixture is made as follows:

Arsenic trioxide	10 Gm.
Strychnine sulfate	20 Gm.
Dilute hydrochloric acid.....	50 cc.
Water q.s.	4000 cc.

The dose is one-half ounce three or four times daily for three days. If the animal is not eating, strychnine poisoning may develop after four days, and the mixture must be discontinued. This mixture is helpful following all digestive disturbances.

For diarrhea I use krameria, bismuth and salol and in severe cases I add chalk or tannic acid. These cases should be on a restricted diet. When quite a number of animals have diarrhea, I use an astringent preparation known as Cornhusker Compound, mixed in the drinking water. This preparation is also useful for coccidiosis of young cattle. Where these conditions occur too often, the feeding and care of the animals is at fault, and should be corrected. Sometimes the hay is bad and by changing to a different cutting the trouble stops. This is especially true with bloating. By feeding corn ground with the cob or feeding broken ears, a lot of digestive troubles can be eliminated; the extra bulk of the cob seems to do the trick. A protein supplement is also necessary for good gains and it improves the general condition of the animal.

Fattening cattle occasionally develop urinary calculi, the calculus lodging in the bladder, neck of the bladder or in the urethra—usually in the S-shaped part of the penis. The resultant retention of urine causes distress, evidenced by colic-like pains. The pulse in these cases is generally high and the temperature normal if the bladder is not ruptured. An examination of the bladder *per rectum* will verify a diagnosis. If the animal is fat and marketable, the bladder can be emptied by mak-

ing an incision over the pelvic bone, just below the anus, down to and into the urethra. The incision into the urethra should be liberal, about an inch long. The wound is left open and the animal is shipped to market about three days later. This amount of time is allowed to lapse so the body tissues can lose the taint of urine. If such an animal should be slaughtered immediately, the meat might be inedible.

For animals that are not ready for market, a different procedure is taken. An incision is made below the pelvic bone about four inches in length, down to the penis. The penis is loosened from the surrounding tissue the length of the cut, a blunt strong instrument is carried back of the penis for outward traction and the penis is severed with a knife as far down as possible. This loosened portion of the penis is carried out and attached to the edges of the skin by sutures. Two deep over-lapping sutures are made into the corpus cavernosum, from the skin in either side. Thus the penis is secured to the skin and controls hemorrhage from the stump. The urethra is split about an inch and the membrane served to the skin with several sutures in each side. Due to the site of the operation, the incision below and above the attachments is left open. Infection can be controlled better in an open wound. Epidural anesthesia should be used in these operations. I am indebted to Dr. J. C. Carey of West Liberty, Iowa, for the technic of this operation.

However, these cases are not always as simple as this. Sometimes the patient shows these symptoms, but is not relieved by the operation, or the patient may not show these colicky pains, but lie around dull and listless, becoming ever weaker; the bladder may not feel full, yet the animal is dying from uremic poisoning. *Post mortem* one may find a distribution of fine calculi, about the size of fine lake sand, from the ureters to the sheath. The walls of the bladder are highly inflamed and thickened; the same may be true of the urethers and the urethra; the kidneys are edematous, may even be floating in urine. I have no treatment for these cases.

Sometimes these small granules may ac-

cumulate in the sheath, causing an inflammation of the mucous lining, with an edematous swelling of the surrounding tissues. By liberal flushing of the sheath most of the material can be removed, and as soon as the swelling is reduced, which can be assisted by hot and cold applications, the animal should be shipped to market. You have no assurance that this condition will not recur. However, a swollen sheath is not always indicative of granules in the sheath. This edematous condition is also caused by necrosis of tissue due to calculi imbedded in the penis.

In closing I would say that in order to conduct a satisfactory practice with feeders, you must spend some time in the feedlot—discussing with your client, in his own language, his feeding problems. I have learned a lot from my clients and still have much to learn.

The American bulwark of dairy and meat products and canned goods will be a hard barricade for our enemies to break through.

Most of the tenant farmers and farm hands who bought farms a few years back under the Farm Tenant Act are paying their way out. Of loans amounting to \$88,000,000, delinquencies amount to but \$430,000.

Approximately 1,500,000 lbs. of turkey were served to soldiers of the United States Army on Thanksgiving Day and about 1,000,000 pounds on Christmas. The Navy served about 360,000 pounds for the sailors' Thanksgiving dinner.—*From Poultry Tribune*.

The great change that has been made in the ration of soldiers is indicated by Uncle Sam's annual bill for fresh milk which amounts to the cost of 1,500,000 pints daily. Fresh milk was not listed in U. S. Army rations from 1776 until the present emergency.

EDITORIAL

The Nation's Unknown Animal-Disease Problem

DISEASES of farm animals are costly things and the absence of figures on the tongue's end to prove the fact is a misfortune. Were every veterinarian able to state precisely the amount of wealth and food that is swept away by diseases of animals and the freshman student could be told in terms of dollars and cents why he is taking a course in veterinary medicine, the veterinary profession would be on a more solid footing. The benefit to the people would be immense, and ours would have the rating of an indispensable profession in the nation's affairs without argument. The figures would prove that our educational system should be enlarged, our work expanded and kept in the hands of its graduates for planning, supervision and execution. The AVMA needs a fact-finding branch. Our plea is for strength enough to establish one. When a sufficient numerical strength has been attained the task of gathering vital statistics, showing precisely what the animal-disease problem of the nation is, would be but a matter of administrative detail.

The veterinary service works in the vast livestock empire illustrated by the USDA in the article on page 140. Poultry, goats, fur-bearing animals, dogs, cats, zoo animals, miscellaneous pets and wildlife should be added in grouping the value of the country's animals. Conservative statisticians place the value of the five main groups of farm animals at \$5,000,000,000.

To this sum one may add, arbitrarily, another two billion for the other groupings to make the total seven billion dollars—the on-the-hoof value at the farm and home. From these animals there emerges the people's main source of food, much of their

clothing (wool, leather, furs), and the tremendous industries engaged in manufacturing, processing and distributing the output. Although the veterinarian works all along the lines of these industries and the investment wrapped up in them is too vast and their operations too complex to consider here, they nevertheless portray the ramifications of veterinary work. These presents, in short, are the foundation of veterinary medicine, the science charged with preventing the raw material—animals—from being wiped out or gravely diminished by disease and interrupted reproduction at the source. Only reliable statistics can paint the background of the veterinarian's problem. They should be gathered and made known in order that the *raison d'être* of the veterinary profession may be more generally understood, and its operations more generally encouraged.

No Cans for Canned Dog Food

The cut in tinplate ordered by the War Production Board includes the use of tin in packaging a number of food products and beverages, among them canned dog food. The curtailment applies also to beer, spices, coffee, cereals, biscuits, chocolate, flour, candy and confections, tobacco and petroleum products. The order dated January 27, 1942, directs manufacturers of such products to reduce their use of tinplate for February 1942 by 50 per cent under the amount used in February 1940. The order further restricts the output of such manufacturers to 12.5 per cent of the quantity permitted under the order for February.

Who Will Do the Inspecting?

AS THE SERENE contentment of men and nations gives way to destructive impulses of war, means of self-preservation previously overlooked come into the foreground. One of these, and obviously a cardinal one, is sufficient supply of food and its wholesomeness. The present war, although but two years old, has turned all minds to food and its nourishing values, not to mention the dangers lurking in unfit food. The question involves amplitude, nutritive quality and wholesomeness, three properties the veterinary service is delegated to insure. Of this, for the first time in world's history, the general population has become aware, no doubt more aware than we.

Examples are (1) the need of an ever-increasing vigilance over panzoötics which can quickly reduce quantity by decreasing the number of farm animals, (2) the treatment of the animal and the soil to step up nutritive values of food, and (3) the removal of unfit food from the market by critical inspection. An analysis of these shows how incomplete our service is and, particularly, how short of man power we would be were everything veterinary in character and of benefit to humanity and national security put into operation. Neither in man power nor in planning has the surface been scratched. The federal and state services have done a fine job of keeping down panzoötics, thanks to persistence against considerable opposition, and the federal meat-inspection service has been a blessing.

Hundreds of farm animals, however, perish for lack of medical attention or planned sanitation and, certainly, many more hundreds from tolerating antiscientific practices, such as the unwise use of deadly biologic products on the farms and ranges either from lack of veterinarians or from opposition to the scientific methods they advocate.

There is yet no way of computing the losses of farm animals by disease. Only the main epizoötics get into the records.

The minor ones and the poundage stolen by the stealthy enemies of higher life (worms, insects, bacteria) are not computable. The loss of treated and untreated animals from causes can only be guessed.

It is, however, in food inspection that the shortage of veterinary service looms egregiously. Inspection of meat for local sale lies in the offing. The rate at which the standard milk ordinance of the U. S. Public Health Service is being installed in cities of all sizes and locations and the extent to which food inspection in compliance with army regulation is expanding with the growth of the military forces, correspondingly augment the task delegated to the veterinary profession through the years of its development. Whether the profession is going to drift along with the come-what-may, *laissez aller* spirit or attempt to interject itself into these forward steps of the public health service is for us to answer now. Mankind is not going to go backward in public health programs. If veterinarians do not furnish the man power and aid in planning for them, in so far as they apply to animals and food, someone else will be trained for the job.

In other words, as public health measures concerning animals are installed and aggrandized, "Who will do the inspecting?" The veterinary profession has a practical as well as an academic side to handle. Besides the shortage of personnel for the present emergency, there are visions of the future to be considered, for where there are jobs of importance to be filled, someone will be found to fill them. Whether, in the expansion of food inspection, the inspectors will be veterinarians or others is a question of training and supply. The battle of the public health service for better food and nourishment is being fought out and the picture of the future field of food inspection is being painted. If the spots where the veterinarian fits into the picture were painted in, they would far outnumber the names in the whole directory, granted that all of the meat and

milk were properly inspected. The shortage of veterinarians is, therefore, relative—relative to the ground the profession is able to cultivate with its limited number of hands.

In food inspection, as in other branches of practice, the people blunder through somehow where no veterinarians exist, but always patronize with increasing gratitude the qualified ones who come into their midst. Health boards are not exceptions, for in many places they do appreciate the capable veterinarian who takes an interest in their work.

The Journal Depends upon Its Friends

IN QUOTING THE ditty of a column run daily in a metropolitan newspaper,*

The Wake.....Depends
Upon Its.....Friends

the intention is to emphasize the virtue of news from the field in striving to make the issues of the JOURNAL as accurate and complete a record of passing events as is possible. In this effort we look eagerly for help from the resident secretaries and the officers of constituent societies, but also solicit all officers of the Association, committeemen and members to become interested in this part of the Association's service. Without this aid we have to depend too much upon a newspaper-clipping service of dubious value for news that should be coming along regularly from within the Association.

Since the JOURNAL has never before attempted systematic recording of passing events, the importance of doing so seems to have been too generally underestimated. The blanks mailed at regular intervals to men prominent in the affairs of organized veterinary medicine, soliciting news for publication, are not taken seriously enough in many states, with the result that facts of creative importance are never recorded, or not properly presented. An example is news from Arkansas, taken from a Little Rock newspaper, glorifying the meeting

of a non-graduate society in that state which the editorial room mistook for a bonafide report of the state association. Mistakes of this genre as well as omissions reflect silence from the field where the JOURNAL looks for useful information.

Unfortunately, we have no reporters to attend all of the state and local meetings and must, therefore, look to officers of the constituent associations for reports of proceedings. While printed announcements of meetings and programs are not lacking, accounts of proceedings continue to be more or less hit or miss and thereby leave gaps in the chronologic history our journal aims to furnish. To do its duty to the profession the JOURNAL should be made a gazette in fact—one that will depict current situations for all time to come.

That Polemic Question of "Practical" Journals

AS IF CONSTRAINED to apologize for printing an excellent article on the water buffalo, the editor of *The Veterinary Record* gives sound advice to British veterinarians in pointing out that some veterinary graduates in recent years have lost interest in contributory knowledge. The general practitioner and the specialist are apt to underestimate the value of knowledge "cast in the language of the laboratory," and failing to acquire a broad knowledge of veterinary science "has cost the profession dearly in prestige and opportunity," now that a total war is instilling into the minds of the people the realities of the problems confronting them.

Obviously (and we quote), "Interest in matters of agricultural importance rather than in the unrealities of immediately remunerative luxury are to be fostered, if not too late." In short, a narrow knowledge of veterinary science as a whole among those who labor in any one of its branches is not conducive to public welfare and, least of all, to the advancement of the veterinary profession.

The *Canadian Journal of Comparative Medicine and Veterinary Science* is also

*Arch Ward. In the Wake of the News, The Chicago Daily Tribune.

reminding its readers of the debt they owe to those who give their time to the high purpose of that periodical in answering complaints about "a more practical journal."

Coming on the heels of a somewhat sharp editorial in a prominent American livestock paper to the effect that the veterinary profession is paying too much attention to dogs and too little to pigs, these editorials contain good advice to the veterinary profession of all countries. No one knows better than the editors of the veterinary journals of the present time that pleasing the crowd with so-called practical material is the poor way to build up the kind of profession the general practitioners need for their own salvation. In fact, the thirst for "practical" literature only takes the practitioner into an impractical road. Success in practice comes from basic education in the medical sciences and in the personal ingenuity displayed in using it, not in being constantly coached in practical stunts.

In so far as we are capable of judging, there is no impractical veterinary literature except that which is not scientific. The impracticability of "practical" literature for which some seem to crave (we have no definition for it) is that it takes the reader in the direction he really does not want to go—downward.

Number and Value of Farm Animals in the United States

According to a graph recently distributed by the USDA the population and value of our farm animals as of the year 1941 was as follows:

Kind	Number	Value
Horses and mules..	14,602,000	\$1,155,000,000
Meat cattle	45,749,000	1,340,000,000
Dairy cattle	25,917,000	1,454,000,000
Swine	52,981,000	440,000,000
Sheep	55,880,000	376,000,000
Chickens	414,000,000	272,000,000
Turkeys	700,000,000	16,000,000

The fact that this amount of wealth is constantly exposed to the ravages of infectious diseases is a lesson on national economics that the veterinarian is endeavoring to teach.

What Are We Driving At?

Just two things: (1) Advancing veterinary science in every respect and in all of its divisions, and (2) particularly its proper application on the farms, in the homes, in the food industries, and at the hospitals.

This platform is simple but it covers a great deal of territory and touches every member of the profession, his work, his job and his daily life. The objective is the good of mankind, not of the profession except as a means to that end. If the members will keep these two aims in mind, there should be no misunderstanding about some of the Association's decisions which may seem temporarily harmful to one group or the other.

The first concerns the educational system and the domain of veterinary-medical research and investigation and the second, the work of the qualified veterinarian in the public or the private service. The latter apply the knowledge of the former for the benefit of the nation. This makes it mandatory for the Association to fight quackery in whatever form it shows its ugly face, just as the medical profession has found it necessary to do through its years of development. There can be no compromise with the improper application of veterinary science, hence the obligation organized medicine owes to private practice, to federal and state disease-control projects and to meat and milk hygiene. What we are really driving at is keeping veterinary work in veterinary hands and under veterinary administration, and to see that a trained personnel is furnished to accomplish that end. A half-trained personnel will not do in either rôle. No one questions the good intentions of interlopers during these evolutionary years. It is merely a question of guiding veterinary science and its use over the right course with general welfare uppermost in mind. If that tramps on some toes, here and there, the profession can not sidestep its general principles.

Report of the Chief of the Bureau of Animal Industry (1941)

(A Book Review)

A timely introduction to this annual report is drawing attention to the fact that notwithstanding the troubled international situation, the country has been kept free of the treacherous animal plagues that are continuously harassing other countries by complicating their wartime efforts. Success in keeping out foreign plagues and controlling native ones is attributed to rigid quarantine measures for animals and nonliving carriers of infections and to aggressive campaigns prosecuted by federal, state and other agencies.

Brucellosis.—The year was distinguished by the further development of area testing for the elimination of bovine brucellosis. On June 30, 1941, 391 counties in 23 states were declared modified accredited areas, and 34 states have adopted calfhood vaccination to implement the test-and-slaughter method. A notable achievement was the proof that the virulence of strain 19 does not increase by repeated animal passages.

Tuberculosis.—The entire country, including Puerto Rico, and the Virgin Islands were declared modified accredited tuberculosis-free areas November 1, 1940. For 1941, out of 12,229,499 cattle tested with tuberculin only 0.3 per cent reacted—the lowest since 1917.

Phenothiazine.—To aid in combating the spoliations of worm parasites, the anthelmintic action of the drug—phenothiazine—discovered by Bureau workers three years ago, promises to dispose of one of the major disease problems of horses, cattle, sheep, swine and poultry. Unfavorable reactions in certain horses treated with this drug for blood-sucking worms were overcome by lowering the dose to 30 Gm. For ascariasis of swine, phenothiazine compares favorably with oil of chenopodium and it has the additional advantage of removing nodular worms and coccidia. The mortality of coccidiosis in lambs was reduced from

10 per cent in 1938-1939 to 2 per cent in 1940-1941 where dry mixtures (alfalfa hay, alfalfa and molasses, ground corn) were substituted for corn silage, the moisture of corn silage having proved favorable to the development of coccidial oöcysts.

National Defense Program.—One of the means of increasing food production for domestic and foreign needs were experiments on feeding and breeding in producing the more advantageous type of hogs—hogs yielding the most desirable cuts of ham, bacon and loin. The work included the study of heating pork and beef before freezing. Details of the processes are described.

In cattle, studies were made of mineral supplements, in addition to the advantages of the "better sires" program of past years, in its relationship to feedlot gains, dressing percentages and quality of offspring. Cows fed supplements of calcium and phosphorus produce more and better calves. In one experiment conducted in Texas, 76 per cent of the cows fed these supplements produced a calf each year while only 23 per cent of the controls produced calves. At the Beltsville station it was shown that cows receiving an inadequate amount of carotene (vitamin A) produced deficient offspring whereas the opposite was true of calves born of well-fed cows.

Throughout the field of animal production (swine, sheep, cattle, goats and poultry) the actual work on breeding, feeding and disease prevention carried out to obtain maximum increase in the food poundage, is described. Nothing seems to have been overlooked in accomplishing the desired end.

Personnel.—The Bureau has 4,428 employes of whom 2,081 are rated as "professional and scientific." Of the latter, 93 per cent are graduates of accredited veterinary colleges. The number of graduates

from the 10 American veterinary colleges was 568, or 88 more than in 1940. The number of students enrolled was 2,560, or 62 fewer than in 1940. Seventeen foreign colleges are recognized by the Bureau.

The amount and the scope of the work done by this small force of professionals is found in the revealing statistical tables the report contains. To study these is to marvel at how so small a force can accomplish so much in field work, research and investigation, food inspection and nation-wide administration. Some of the figures to ponder are:

Meat and meat products inspected (lb.)	10,514,837,866
Meat and meat products inspected for the army, navy, etc.	419,491,487
Antemortem inspections (animals)	82,092,806
Postmortem inspections (animals)	82,062,191
Animals condemned (postmortem)	262,848
Animals condemned (antemortem)	31,763
Livers condemned (cattle and calf)	1,057,754
Parts condemned (lb. other than livers)	970,101
Foreign meat and meat products inspected (lb.)	99,895,039
Legally exempted (lb. farm slaughtered)	2,045,228
Legally exempted (lb. butchers and dealers)	8,386,836
Imports inspected (animals)	815,239
Exports inspected (animals)	9,548
Tuberculin tests (cattle)	12,229,499
Tuberculin tests (total since 1917)	241,943,522
Brucellosis tests (cattle)	7,737,341
Anti-hog-cholera inspected (cc.) ..	1,137,057,909
Hog-cholera virus inspected (cc.) ..	279,898,928
Anti-hog-cholera serum rejected (cc.)	16,129,519
Tetanus antitoxin rejected (units) ..	4,400,000
Other biological products rejected (doses)	2,795,731
Hog-cholera vaccine inspected (cc.)	625,375
Inspected for interstate shipment (animals)	70,509,906

The report breaks down these figures in respect to species, products, diseases concerned and other items in the numerous statistical tables.

As all prolixity is already boiled down, limited space prevents the writing of a complete review of the fascinating story told in this report. It is the story of the organization, administration, scientific work and disciplined policing set up to guard the food supply of the American people. [*Report of the Chief of the Bureau of Animal Industry, 1941. By John R. Mohler, Chief. 92 pages. Paper. Government Printing Office, Washington, D. C.*]

Raising Horse and Mule Feed

Those who keep in close touch with farming, like the members of the veterinary profession, have frequently expressed their amazement at the way farmers went on raising horse feed regardless of the vanishing equine consumers. The horse and mule population of the United States for 1920 was 25,199,552. In 1940, it was 13,931,531, a decrease of 11,268,021. The 1940 figure is approximately the same as that of 60 years ago. The agricultural census of 1880 placed the number of horses and mules in the whole country at 12,170,296.

Although the declining horse and mule population has been mentioned here and there as a factor in the perturbing agricultural question, it has not been as well assessed by anyone as by the veterinarians. To us, raising horse feed was like manufacturing buggy whips. As an Iowa practitioner once stated, "Raising oats here is like making sleigh bells in Key West."

In short, to get at the bottom of the farm troubles, statesmen need to study the dislocation that came about as over 11 million consumers of horse feed passed off the landscape while machinery went right on raising more horse feed for horses that did not exist.

We are at war with cunning and ruthless enemies, more powerful than the cohorts of Alexander and Napoleon. Blood, tears, privation, sweat and all-out will be needed to subdue them.

Shortage of Veterinarians Not Universally Understood

Unfortunately, wherever the shortage of veterinarians is broached the impression seems to prevail that the deficiency applies only to the private practitioners, whereas the shortage is in other branches of the service. Nor are the areas left without competent practitioners the main issue. When the JOURNAL pointed out that to properly service the vast livestock industry of the United States there should be at least 20,000 graduate veterinarians, it did not say that the increment should be scattered for private practice among the existing practitioners. It is admitted that some cities and communities are already overcrowded so far as doctors for the sick and injured animals are concerned, but the fact that a great deal of service properly belonging to the field of veterinary medicine has passed into outside hands is not generally studiously considered. Except in the federal service, the vast fields of scientific research on animal diseases and of nutrition and food inspection are not cultivated by veterinarians. Many of these services have fallen into other hands, because there is not specialized personnel enough to fill the places created to supply the needs of the going livestock industry and its ramifications. It can not be denied that in the realms of scientific research and food inspection the veterinary college graduates and the state licentiates are not holding the ground belonging properly to the veterinary service. The cause is shortage, not of practitioners in the cities and farm areas but of specialized personnel in other branches that are leaving scarcely more than the prosaic work of veterinary practice in the profession's hands. Where a broad view of the whole veterinary-medical picture is taken, the meaning of "shortage" is better understood.

War is not just around the corner. It's here, just where it has been since 1939.

In the Matter of Medical Jargon

If one contends that teaching proper usage of medical, near medical and non-medical terms does not come within the scope of veterinary journalism then one does not agree that the level of a profession is the level of its printed word.

To be convinced that proper usage should be one of the cardinal objectives of a veterinary journal, one compares the literature of the medical press in 1941 with the jargon of 1900 which the American Medical Association set out to improve many years ago when the physicians of *then* like the veterinarians of *now* were careless writers—careless with the general language and the language of medicine.

Let it be understood that these flings at *usage* are made without claim of pedagogic virtue but rather with the object of keeping alive a matter too generally dodged. In the strict analysis of the term, men of medicine are not supposed to be *good writers*. In all history but few men attained that rating. The ability of a famous litterateur and that of the casual writer exposing his experiences are horses of a different shade. *Les critiques litteraires* of the latter do not claim to be competent critics of the former. The veterinarian striving for a place among the famous medical writers of history is apt to be disappointed. In running the gauntlet of true literary criticism he is apt to get the tomahawk on the first down and some yards to go. There are a lot of words in the dictionary and putting them in the order that will attract the attention of the coming generations is a chore beyond the ken of minds running in their own specialized direction.

"In the Matter of Medical Jargon," however, the objective is to keep *literature* and *achievement* on a common level. Striving for a place among the classics is not on the trestleboard, yet the language we use is the barometer of our character and the pedigree of our profession. To make it as good as possible is an obligation.

Felicitates Chief Mohler and His Command

(An Abstract)

When Dr. John R. Mohler was chosen by Secretary Claude R. Wickard to supervise the publication of the Yearbook of the United States Department of Agriculture for 1942, the *National Grange Monthly*, voice of America's oldest farm society, seized the occasion to review not only the biography of the man but also the main achievements of the Bureau of Animal Industry accomplished under his direction.

Although a story of facts well known in the history of American veterinary medicine, the article, without seeming intentionally eulogistic, supports the popular saying that truth is stranger than fiction. From practitioner in Philadelphia (1896) to the Bureau's field force and thence over the rough and undeveloped road of animal pathology to the office of chief, there emerges a chapter of American development that only the coming of a great war of self-preservation could have brought into the foreground of national affairs.

The selection of Chief Mohler for the task (*loc. cit.*) was logical, says the author, because "the next yearbook will feature animal diseases and pests together with their cure and eradication." Within this quotation lies the page of American history that the veterinary profession has been striving to bring into the realm of common knowledge. The effect of animal diseases on human welfare is unfortunately not common knowledge. Notwithstanding that no large nation can dodge that issue and survive, disease in farm animals is a curious unknown to the general population even as its very life is threatened by ruthless enemies. Like the empty arsenal of the unprepared, farm animals and their diseases become the cynosure of all eyes only after the bombs begin to drop. They are then weighed *una voce* with other vital problems confronting the nation in trouble. Thanks to foresight covering many years,

the animal "arsenal" was not caught empty when the present threat came along. It had been guarded and filled to the brim and overflowing. That, we believe, is what the *National Grange Monthly* meant to say when it stopped to panegyryze the life and work of Dr. Mohler.

The article points out that Dr. Mohler (quoting) "pathologist, bacteriologist, veterinarian and administrator of an annual appropriation of \$15,000,000" not only watches over animal diseases and outlines the research and investigational work required to keep abreast with the times, but also directs farm-animal improvement through scientific breeding, genetics, feeding and nutrition.

The Chief is introduced as a courteous and friendly man who knows how to work in harmony with federal, state and county officials and the numerous livestock and trade organizations touched by the Bureau's complex activities, but (and we quote again) "he resents any attempts that may be made to take advantage of him" in his task of administering the laws and regulations governing the operations of the livestock industry: disease control, meat inspection, supervision of biological products, livestock management, etc.

The author also refreshes our minds on the work of the past which now makes the United States stand out as a source of sustenance for a world of chaos. From this phase of the article we abstract:

1. The audacious undertaking, started in 1906, of eradicating a species of arthropods—the Texas fever tick—from the vast expanse of the South, which is now 99 per cent complete.

2. The unprecedented task of abolishing bovine tuberculosis, started in 1917, from our vast livestock population, which improved the wealth and the health of the American people to a recognizable degree.

3. The discovery of a successful method

of vaccinating hogs against cholera and improving the method from time to time.

4. The use of heat and of refrigeration in destroying trichinae in pork.

5. The development of the McLean County system of swine sanitation which put a new and practical disease-fighting weapon in the hands of the swine-breeding industry, and incidentally led to the systematic handling of other infections.

6. The successful eradication of foot-and-mouth disease and European fowl pest and maintaining quarantine measures against their recurrence.

7. The discovery of a stained antigen for detecting the presence of pullorum disease in domestic fowls, making it possible to eliminate the disease through destroying infected hens.

8. Inauguration of a systematic campaign against bovine brucellosis, including calfhood vaccination by means of a vaccine made from a *Brucella* organism of reduced virulence (Strain 19) which the Bureau discovered.

9. The practical elimination of sheep and cattle scabies and of dourine in horses.

10. The discovery of the anthelmintic properties of phenothiazine in combating certain worm parasites of ruminants and of barium antimonyl tartrate dust for controlling gapeworm infection of young poultry.

Among the achievements less commonly known are (1) the sponsorship and development of regional research laboratories where animal diseases may be studied on home ground; (2) the "better sires" and "better stock" campaigns such as the use of quality bulls, rams, and stallions; (3) the breeding of Morgan and Nonius horses, "streamlined" turkeys, Columbia sheep, Landrace swine, Zebu and Africander cattle, Karakul sheep, and sheep dogs; (4) the judging of meat for palatability and nutritive values; and (5), not the least, keeping the public informed on what the veterinary service is doing by means of lit-

erature, motion pictures and educational exhibits at meetings of agricultural and scientific societies throughout the country.

Going back to the Chief's biography, the author points to such eulogies as his portrait among famous figures in American animal industry at the Saddle and Sirloin Club (Chicago) unveiled by the American Society for the Promotion of Animal Production in 1925, the Medal of Merit of the Society for the Promotion of Agriculture of which George Washington and Benjamin Franklin were patrons, the International Veterinary Congress Prize of the AVMA (1939), the Kober Foundation award (Washington 1941) bestowed for his contribution to human welfare, and his presidency of the American Veterinary Medical and United States Live Stock Sanitary associations in which he remains active. As chairman of the USDA Poultry Committee Dr. Mohler watches over the development of poultry production.

Such are the highlights of a career as seen through the eyes of the oldest agricultural society in the United States—the National Grange.

Bovine Tuberculosis Eradication and Public Health

The lowered incidence of certain types of human tuberculosis following in the wake of the campaign waged against that disease in cattle is an outstanding achievement of American medicine for which the veterinary service is duly credited in the councils of the medical profession. Each report coming to light shows that bone and joint tuberculosis is vanishing in children far beyond the highest expectations. A recent example was the astounding statement of Dr. Arch F. O'Donoghue, orthopedic surgeon of Sioux City, Iowa, where he emphasized before his peers the health benefits from the animal-disease control program. We quote:

"In three and a half years starting January 1, 1936, at about the time we began to feel the influence of dairy-herd inspection

Your Income-Tax Return

FRANK T. MOLONEY

Chicago, Ill.

Now that almost everyone is going to be taxed under the new income-tax laws, interest in the annual duty of making out an income-tax return concerns every veterinarian. Having been reminded by a California member that correct advice on allowable deductions for veterinarians would be useful guidance, the Association's auditor was requested to interpret the law for the JOURNAL. In compliance, he submits the following:

BUSINESS OR PROFESSION: ALLOWABLE DEDUCTIONS

- | | |
|---|--|
| 1. Taxes. | 12. Bad debts. |
| 2. Telephone. | 13. Cartage and express. |
| 3. Traveling. | 14. Donations, not over 15% of net income. |
| 4. Transportation. | 15. Light, heat, gas. |
| 5. Personal Exemptions: Married, \$1,500; single \$750; Dependents, \$400 each. | 16. Insurance. |
| 6. Net earned income, 10%. | 17. Interest and collection charges. |
| 7. Automobile upkeep. | 18. Materials and supplies. |
| 8. Accounting or auditing. | 19. Office supplies. |
| 9. Advertising. | 20. Printing. |
| 10. Association dues. | 21. Postage. |
| 11. Books, periodicals, magazines. | 22. Rent. |
| | 23. Salaries. |
| | 24. Repairs. |

Since veterinarians are classified as professional men who are expected to participate in the work of their organizations and they have to read books, journals and magazines published for their edification

(Continued from preceding page)

in this state (Iowa), the incidence of bone and joint tuberculosis (bovine type) in children has been exactly 14 per cent of what it was in the ten-year period between 1926 and 1936—a decrease of 86 per cent, probably entirely due to tuberculin testing and inspection of dairy herds and the removal of the reactors."

reasonable deduction for these items of expense are allowable. The letter of transmittal reads:

To the Editor:

For the benefit of the members in reference to their income tax return, I am pleased to attach hereto the list of allowable deductions as they apply to them. Since the veterinarian not working for wages is considered as being in business for himself all of these items are deductible. They apply also if he practices as a corporation.

Very truly yours,

Frank T. Moloney, Auditor.

Members may address the Executive Secretary for any further information they may require. The final date of filing income-tax reports (federal) is March 16.

During the 23-year fight against bovine tuberculosis 323 million tuberculin tests were made and about 4 million cattle were removed and slaughtered.

Buying Defense Stamps and Bonds is loaning money to the government at an attractive rate of interest. It is like buying greenbacks that grow in value. The government needs the money to defray the cost of defending your dollars and your freedom.

Two of the four horsemen of the Apocalypse, War and Death, have been riding through the Old World for two years. A third, Famine, with winter here, appears to be on his way. The fourth, Pestilence, is destined to take the trail sooner or later.—*The Cattleman.*

The farm income for 1941 is said to be about \$11,000,000,000 or 25 per cent more than that of 1940. The greatest gains were among livestock producers. The Lend-Lease Act and increased employment, not increase of prices, is the cause.—*L. G. Elliot, President, LaSalle Extension University in Pathfinder.*

SURGERY & OBSTETRICS

AND PROBLEMS OF BREEDING

Sterility in the Bull

FRED W. MILLER, D.V.M.

Whitewater, Wis.

STERILITY in the bull indeed is a comparative as well as a complex phenomenon manifest by failure to produce conceptions consistently. Some of you may consider sterility as but one of the symptoms of disease, injury, malformation or malfunction of the genital organs. It is however, of prodigious economic importance, and may be partial or complete and temporary or permanent.

Some dairymen keep bulls for the purpose of, or at least the hope of, improving the herd and some to maintain the milk production without interest in improving the herd, except by purchasing cows ready to milk. All calves are vealed. With the advent of artificial insemination societies, others keep bulls for the effect of their presence on the herd, believing the cows behave better when a bull is present. Some use these bulls as teasers only.

Our main interest is with the bulls used for improvement of the herd; however, it is sometimes more economical to keep and treat bulls than to replace them.

Bulls used in the same herd show the comparative values of the fertility of these bulls, but bulls of similar fertility being used in different herds may have records of vast differences in the number of matings for each conception, showing that the factors involved in maintaining normal reproduction are many.

Many times dairymen come to their veterinarian for help in solving problems of sterility with a very incomplete history. The entire herd must be studied and it is not uncommon to find only two or three open or barren cows and the majority preg-

nant. The condition of the herd usually tells us something of the sire's fault and accordingly we should make a careful study of his condition.

Examination of the sire requires hard work, study, and occasionally a great deal of time. Important and very helpful in the examination is a complete history.

Obtain all the information possible about feed, management, amount of exercise, housing conditions, handling of bull when mating, and the number of matings and number of cows bred. Also find out if matings are seasonable or spread throughout the year.

The health of the bull should be studied by observation: Palpation, scent and auscultation are helpful in determining the general health of the animal. The entire genital system of the bull can be examined by palpation. Bulls will stand still while the external organs are gone over with the hand in the rectum to examine the accessory organs. When mating observe all muscles used in the act and note the condition of the penis.

An examination of the semen is essential in determining fitness for service. This examination may be very complete including chemical, physiologic, bacterial and protozoan studies, but in practice a less exhaustive study gives helpful information. The semen may be collected with the artificial vagina or by massage of the ductus deferens. An immediate examination of the semen with a microscope, equipped with a 16 mm. objective and a No. 10 eyepiece,

will show clearly if the semen is densely or sparsely inhabited with spermatozoa that are normal morphologically and if they are inactive, sluggish or active.

In a mass of actively moving spermatozoa it is difficult and sometimes impossible to observe other moving objects of similar density. One such object—*Trichomonas foetus*—can be detected by incubating the semen at 35 to 38 C., making microscopic observations at six-hour intervals for 24 to 36 hours. Due to the fact that spermatozoa *in vitro* at body temperature soon lose their activity and *T. foetus*, whose natural habitat is in mucus, continues to multiply and move about among the inactive spermatozoa they are easy to see. They may be seen clearly moving about in the mucus.

I believe most sterilities in bulls may be considered as due to mismanagement and accidents. Conditions rare in bovines and recognized before they become important are anorchism, cryptorchidism, hermaphroditism and congenital malformations. I have found aspermia in two young bulls apparently healthy in every other respect. Their history revealed only that they were full brothers.

Bulls that have been transported from one part of the country to another in trucks or trains may show sterility for one to eight or nine months. Why this is true I am unable to say. I have noticed that when the floor of the vehicle in which bulls are transported is covered with several inches of earth, the period of sterility is shortened. However, other factors were not studied. Careful feeding and exercise hastens return to normal fertility.

Under mismanagement any one of the following or any combination of them may be found: improper feeding, poor housing, excessive mating, and lack of or improper exercise. The results vary from sterility of short duration to permanent sterility and a shortening of the period of usefulness.

In some parts of the country feeding of orts to the bull has been practiced. This deprives the bull of vitamins and minerals necessary for the maintenance of normal,

healthy body tissues, the cows having already consumed the best parts of the feed. Where the bull is fed the same feed as the cows and little or no attention is given to the amount fed or to the regularity of feeding it may result in lower efficiency of the bull and enlarged abdomen, which interferes physically with mating. Other bulls are fed to fatten them for showing at fairs. These practices slow up reproductive capacity and ability.

Improperly fed bulls are susceptible to skeletal injuries. The last thoracic and lumbar vertebrae and the hip joints are most frequently injured. Complete ankylosis of the vertebrae which in time caused the death of bulls has been observed. These injuries interfere with and eventually prevent natural matings.

Sterility also results from debilitating systemic diseases, excessive sexual activity and in strong vigorous bulls direct injuries to some parts of the genital organs while mating with small or ill-shaped females.

Many things have been tried in attempting to overcome sterility in bulls, some of them successfully and some not so successfully. Of paramount importance is the adjustment of feeding and handling to assure vigorous health. In fact, as much attention should be given to feeding and care of the herd sire as to that of the cows on official test for milk and butter fat production. This is so important, with our increased use of bulls in artificial breeding societies, that research in the feeding of bulls for efficient results should be carried on vigorously.

In general, feeds which give the necessary nourishment and vigor without increasing the size of the abdomen are essential. In some cases good results are obtained by simply reducing the amount of roughage. Last winter I found a bull filled with shredded corn-fodder and his record of conceptions was low and a picture of his semen showed morphologically normal spermatozoa but many of them were inactive. By having the fodder replaced with alfalfa hay and also adding wheat to the ration this bull improved and later his record of

conceptions increased to near perfection. This case is a repetition of many others showing that the genital organs function normally when the animals are supplied with the vitamins found in the oil-bearing portion of the grain and also those found in the leaf portion of green plant.

VITAMIN C TREATMENT

Benefit from the use of vitamin C has been reported by Dr. Paul Phillips *et al.*, of the University of Wisconsin. In Wisconsin Bulletin 450, What's New in Farm Science, Part 1, they give the dosage as at least 1 Gm. of ascorbic acid for each 1,000 lb. of live weight.

It seems necessary to inject the ascorbic acid hypodermically, since feeding the vitamin did not improve the potency of bulls. They state that ascorbic acid injections generally had these effects:

- (1) The ascorbic acid content of the animal's semen and blood plasma increased, moving into the normal range.

- (2) The quality and character of the semen was greatly improved, the life of the sperm in yolk-buffer solution being increased three-fold.

- (3) The activity and sex behavior of most treated bulls were markedly stimulated. The standards given for evaluation of semen and potency in the bull are:

- (1) The ascorbic acid content of the blood plasma should range between 0.2 and 0.4 mg. per cc.

- (2) The ascorbic acid content of the semen should range between 3 and 7 mg. per 100 cc.

- (3) If microscopic examination shows the sperm is alive after storage of 200 hours or more in yolk-buffer solution, it indicates excellent potency. Sperm that can be stored for 150 to 200 hours may be considered good; 100 to 150 hours, fair; and less than 100 hours, poor.

My own experience with the use of ascorbic acid though limited has been disappointing because I have failed in making a correct diagnosis. Vitamin C of course

will not overcome all forms of sterility in bulls.

EXERCISE

As a part of proper management it is necessary that bulls be given exercise as has been shown in practice and also in experiments wherein a study of semen and records of conceptions showed that exercise was more beneficial to the function of the genital organs than any other factor.

Exercise may be given by working bulls in a yolk, placing them on a circular exerciser or with a young bull in an acre lot. Any method is satisfactory that keeps the bull walking straight on smooth ground. Devices that cause twisting, sharp turning, or the tread mill are to be avoided because of possible injuries.

GONAD EXTRACTS AND REST

The use of gonadal extracts, transplant of testicular tissue, and vasectomy on one side are more beneficial in young bulls than in old ones; and where large amounts of testicular tissue have been destroyed, good results can not be obtained.

Complete sexual rest is a necessity when attempting to restore to usefulness a bull that has been used excessively. If excessive use has lasted very long the bull may be sterile permanently. Some range bulls and those in community pastures have been found to remain sterile.

If a bull capable of improving the offspring of a herd receives injuries that incapacitate him for mating, naturally, it is feasible to obtain semen from him by massage of the ampullae, inseminate cows with this semen, and thereby prolong his usefulness. This has been done at a number of places.

Small amounts of semen from dead bulls can be preserved for about nine days by refrigeration.

In the interest of efficiency during national emergencies it is important that at all times we do all in our power to prolong the usefulness of worthy sires.

Abdominal Gestation: Foal Survives

WM. A. GOODFELLOW, D.V.M.

Sheridan, Wyo.

A RECENTLY published account of extra-uterine pregnancy in a mare* recalled a similar case I dealt with last spring. On April 19, 1941, I was informed that a mare that had been under constant watch for foaling was in labor and that I should come ready to assist her and give routine care to the foal. In making the exploration to determine the position of the fetus I was mystified by not finding anything within reach of the hand. The stall was searched for a dead foal that might have been delivered unnoticed. There was no doubting that the mare was in labor and that the uterus was empty. When the mare strained on re-examination, a sizable lump was forced upward under my arm at the brim of the pubic. I was able to detect the presence of a fetus entirely outside of the uterus. As the wall of the uterus on further examination was found to be intact, it was evident that the case was one of extra-uterine pregnancy. The fetus was alive and apparently normal in size.

Realizing the chances of cesarean section in a mare under farm conditions, the colt was delivered by incising the floor of the vagina, with the intention of suturing the incision to prevent prolapse of the intestines. The incision, starting well forward, extended back to within two inches of the meatus urinaris. By means of chains attached to the legs and guiding the head into the opening, delivery was effected without difficulty. The placenta followed through the opening but in attempting to remove it completely, it was found to adhere to the exterior of the uterus, the sides and ventrum of the abdominal cavity and contiguous organs. Fearing to injure vital organs and hopeful that the placenta would detach itself naturally, suturing the incision was postponed. This was a mistake as

a few hours later the intestines prolapsed and the animal had to be destroyed. The fetus had a malformed head and induration of its limbs, due no doubt to its unnatural orientation. Strangely, however, the foal lived and is now a good, husky colt of eight months with the exception of a slight crook in one hind leg. It bids fair to become a good specimen of the Clydesdale breed.

Should such a case occur again in my practice I would suture the incision and ignore the placenta. A physician tells me that in human cases the vagina is strongly sutured and the placenta if adhered can be left to absorb without serious after effects.

One could also have implanted sulfanilamide or sulfathiazole in the abdominal cavity and also given the same drugs orally. Dr. Farquharson, Colorado State College, has proved that abdominal surgery in horses is feasible (*Vide*, the JOURNAL, Dec. 1940). It, therefore, seems reasonable that a cesarean section could have been performed on this mare successfully. However, when the fetus is still living and valuable its chances of safe delivery must be weighed against a dangerous and always lengthy field operation.

Medicine in War

When societies such as American Medical, American Dental and American Veterinary Medical associations were surveyed in planning the nation's fight for freedom, they were found organized, alert and available for immediate action. The accumulation of knowledge and putting knowledge to work is their gift to the nation's strength. They kept their houses in order in times of peace and their mechanism was ready when reveille sounded off. They are entitled to and need the united support of their respective groups.

*Glenn W. Relke, D.V.M., Victor, Iowa, the Allied Veterinarian, November-December, 1941.

The Simplified Cataract Operation in the Dog

T. I. MEANS, D.V.M.

Santa Fe, N. M.

THE PURPOSE of removing cataracts is to allow the dog to live and enjoy a nearly if not entirely normal life. To accomplish this I have worked out a simple and practical operation that the average veterinarian can and should practice.

Instruments.—(1) A 2 to 2½ inch Mayo intestinal suturing needle, (2) a pair of small hemostatic forceps.

Separate instruments should be used for each eye to minimize contamination.

Anesthesia.—H. M. C. and ether are preferred to barbiturates which have a tendency to roll the eyeball back and thus to some extent interfere with the operation.

Drugs.—Atropine, ½ of 1 per cent; boric acid solution; 2 per cent mercurochrome; 1 to 2 per cent procaine hydrochloride and epinephrine solution; and 1 per cent butyn in mineral oil.

Precautions.—Be sure there are no inflammatory symptoms, and that the opacity of the lens is complete; that is, when it takes on that "mother of pearl" type of opacity. Operating too soon fails to accomplish the desired results, but does not do any permanent injury to the eye.

Preoperative Procedure.—Withhold feed of patient the evening before, and an hour before operating place patient in dark kennel after instilling a few drops of the atropine into the eye.

Operative Procedure.—About one-half hour after having given the H. M. C. get the instruments, towels and drugs ready. Place the patient on operating table, wash eye and area around it with boric acid solution, instill a few more drops of atropine in the eye to assure complete dilation of the pupil; also a few drops of the procaine solution. Proceed with the administration of ether. When anesthesia is complete drop a few drops of the mercurochrome on surface of eyeball, cover neck and head except the eye with a sterile towel.

Clasp the sclera gently but firmly with the forceps and pull the eyeball out to expose a good portion of the lateral surface of the sclera, and thus fix the eyeball. The needle in other hand is pushed through sclera into eye posterior to and parallel with the iris and on to the opaque lens. Now with a quick downward and backward movement of the point of the needle (which is well into the center of the lens), the lens is dislocated and forced to the bottom of the posterior chamber. Hold it there a few seconds before withdrawing the point of the needle from the lens. If the lens breaks all the better. Then withdraw needle from eye and repeat in other eye if involved. Bandage eyes with moist boric acid packs and place dog in its kennel.

After-Care.—Keep wet packs on the eyes for a few days but if a dark kennel is used I doubt if this is necessary. After wet packs are removed, a few drops of the butyn and oil applied twice daily is all the after-care the eye needs. There is more or less cloudiness for a few days but this gradually disappears.

Result.—The dog can see well enough not to bump into things when the bandages are removed. Vision gradually improves day by day, and its adjustment appears nearly normal after a few weeks.

Case No. 1.—Afghan Hound, 8 months old, brought in to be destroyed on account of a bad disposition, had cataracts developing in both eyes. Hopeful that the disposition might improve if the cataracts were removed, the operation was attempted but owing to the rubbery consistency of the lens I was not able to dislocate it. Although the owner consented to wait, the dog's disposition became so bad that it was destroyed.

Case No. 2.—Afghan Hound, 6 months old with cataracts starting in both eyes, apparently in the same stage as No. 1. The dog was kept in the hospital two months to allow the cataracts time to develop. The operation was performed July 31, 1939, and the dog was kept in the hospital four weeks. Its vision was good

Embryotomy in the Mare*

WALTER R. KRILL, B.Sc., D.V.M.

Columbus, Ohio

Defined, "embryotomy" is cutting a fetus into pieces within the uterus as an aid in delivery; or according to Williams it is "the diminution of the size of the fetus by removing of some of its parts in such a manner as to overcome the obstacles of birth."

In the cow, embryotomy is not commonly used because misplaced parts are usually accessible and correcting their positions is rather easily accomplished. However, in cases of *Schistosoma reflexus* and dystocias of long standing, with the fetus undergoing emphysematous decomposition, embryotomy must frequently be resorted to in this species.

In dystocias in the mare, particularly in the larger draft types, embryotomy is nec-

essary in the majority of cases we encounter. Owing to the enormous size of the fetus and mare it is almost impossible to reach and correct the position of a misplaced limb or head, unless one is called before the uterus has emptied its fluids and contracted tightly around the fetus. Since mares brought to our clinic have all been from 12 hours to as long as 4 weeks in labor they are of the difficult type; the uterus has emptied itself of all fluids and is tightly contracted around the fetus, making repulsion and correction of the position utterly impossible, and embryotomy a necessity.

In performing embryotomy it is preferred to keep the animal in the standing position. This allows the operator to work at a much greater advantage and less tiresome manner and the animal is more contented. It also eliminates the abdominal pressure of an animal lying down. In the clinic, the animal is placed in the stocks to prevent moving around. On the farm, improvised stocks are made by using a short gate to crowd the animal against the side of the stall. The long hairs of the tail are bound down either with a bandage or narrow strips of adhesive tape two inches apart, to prevent contamination of the field of operation, the hands and arms. The external genitalia and surrounding parts are thoroughly scrubbed with soap and water.

ANESTHESIA

Epidural anesthesia is used. It is labor-saving and when properly used, the animal can be kept on its feet, with all expulsive efforts under complete control. All necessary obstetrical operations and adjustments can then be performed without interference and with minimum danger to the patient. Its advantages are perhaps most appreciated in the mare because in that species the expulsive efforts are so great that they soon

*Presented before the Section on Surgery and Obstetrics at the seventy-eighth annual meeting of the AVMA, Indianapolis, Ind., August 11-15, 1941.

(Continued from preceding page)

and reports received from time to time since then show that the improvement was permanent. This fall (1941) it could run afiel with other dogs and seemed to have normal eyesight.

Case No. 3.—The outcome obtained in Case No. 2 brought in another case 400 miles away which was received May 11, 1940. It was an Afghan Hound 18 months old and was operated upon two days later and was shipped home June 10, 1940. In November, the owner reported that he was pleased with the outcome, and promised to report further developments. As nothing more was heard of this case the presumption is that the benefits were permanent.

[The operation above described is a forgotten but not new method of dealing with cataracts in animals. It will be found described and well illustrated in *Chirurgie Vétérinaire*, Volume 11, pages 212-13, by Peuch and Toussaint (1877). At the Alfort school it is still performed under the name of "chasing out the lens" in lieu of removing it.—Ed.]

completely paralyze the arms. In these cases, mutations and embryotomies are practically impossible without some form of anesthesia. Proper anesthesia overcomes half the difficulty in obstetrical cases and often represents the difference between success and failure.

The advantages of epidural over general anesthesia in obstetrical work may be listed as follows: (1) the animal can be maintained in a normal standing position; and (2) the matter of safety. No one can deny the dangers of a general anaesthetic such as chloroform when it must be continued for several hours. It requires a trained anesthetist and since under field conditions it is not always possible to provide satisfactory hygienic conditions, pneumonia frequently develops.

Some may question the absolute safety of epidural anesthesia. Practitioners have reported cases of posterior paralysis following its use; some declare that epidural anesthesia interferes with normal involution of the uterus, resulting in some severe cases of metritis. Personal experiences do not confirm these observations. We have all seen cases of posterior paralysis in our larger animals following parturition due to nerve injury where no anesthesia was used and in some cases where no aid was given in delivery. Probably these account for the paralysis where epidural has been blamed. As to the metritis resulting from loss of contractile power of the uterus, it is doubtful if the usual dose used epidurally has any effect on the uterus; even though the uterus should be inactive for two or three hours, in the absence of infection or severe trauma, metritis should not develop.

Other advantages of epidural anesthesia are more uniformity of anesthesia during the entire delivery, time saving and effort, and the good psychological effect on the owner.

For the administration of epidural anesthesia, a 16- or 18-gauge needle two and one-half inches in length is used. A glass syringe is preferred because it transmits more delicately the amount of pressure required to inject the solution. This is very important, for if the needle is properly

placed in the canal, practically no pressure is required to make the injection. In mares in normal flesh the point of injection is located by passing the fingers forward from the base of the tail on the median line until the first evident depression is encountered. This is located about one and one-half inches anterior to a line drawn across the base of the tail at the point where the long hairs begin to appear. In heavy draft mares it is rather difficult to palpate the depression but by using the hair line as a guide one can easily locate the point at which the injection should be made.

Two per cent procaine in normal physiological saline solution is the anesthetic we generally use. The amount varies with the size of the animal. Mares weighing up to 1,500 lbs. are given 15 to 18 cc.; 1,500 to 1,800 lbs., 20 to 25 cc.; 1,800 lbs. and over, 25 to 30 cc. These amounts are sufficient to control all straining and at the same time do not cause the animal to go down.

OBSTETRICAL INSTRUMENTS

We have had at our disposal practically all the obstetrical instruments that were ever recommended for use in performing embryotomy or mutation. One after another has been discarded until at the present time the only instruments used are: three obstetrical chains sixty inches long, with handles, a Benesch fetotome and a small block and tackle. All hooks and sharp cutting instruments have been eliminated because of the difficulty of preventing injury to the uterus. It is provoking to work for hours and then have the animal die from a punctured uterus. Through the use of a fetotome, embryotomy can be performed in less time, with less effort, and a great deal less danger to patient and operator. The chances of puncturing the uterus are practically eliminated and the cut surfaces of bones are smooth and free of the sharp ragged edges caused by chisels.

Obstetrical chains are preferred over other types of snares because they are readily cleaned and sterilized, are easily

attached to a part and are not as likely to slip off once they are attached.

The block and tackle is a valuable aid for the application of traction. It affords a steady pull, which allows the pelvic canal to dilate, and the amount of traction required can be controlled. Serious results may occur from the use of the block and tackle when used injudiciously, especially in the absence of proper lubrication. In regard to the injudicious use of traction, it can truthfully be said that the block and tackle is frequently used as a means of completing delivery by "brute strength." Such practices are sure to be disastrous. Before traction is applied, one should be sure that all parts are coming into normal position. In normal physiological birth, nature provides that the fetus present itself in a conical form with the fore feet forming the tip of the cone and the base or greatest diameter coming at the shoulders. This allows for a gradual spreading of the pelvic canal so that no bony protuberances become lodged against the maternal pelvis. Conversely, when any of the appendages are out of line, the smooth side of the cone is broken and the shoulder, elbow, head or neck is found to be locked against the maternal pelvis and normal delivery blocked. When traction is applied in these cases without first correcting the position by mutation or embryotomy, severe laceration or rupture of the uterus is likely to result. Another important factor in the use of traction is to take sufficient time to allow the pelvic canal to dilate. One should occasionally release the traction to give the animal a little rest and the operator a chance to introduce lubricants and make an examination to insure that the delivery is progressing satisfactorily. While traction is being applied, delivery can be made much easier by working a well lubricated hand around the fetus inside the maternal pelvis. Twisting the fetus is also an aid in overcoming tissue resistance. Where proper time is allowed for traction and sufficient lubrication is used, laceration should not occur. The use of ample lubrication, especially when the tissues are swollen and edematous, can not be over emphasized.

EMBRYOTOMY IN THE VARIOUS PRESENTATIONS

I. *Anterior Presentation with the Head Deflected.*—Examination reveals both fore legs in the pelvic canal, with the head deflected either laterally, up and back or down between the fore legs. In the mare, it is frequently impossible to determine the direction of the deflection in these cases. The first step is to amputate one of the fore limbs in the following manner: The fetotome is threaded, leaving a loop of wire about eight inches in diameter on the cutting end. The leg to be amputated is inserted through this loop and the fetotome passed up the leg until the thorax is reached and the head of the saw lies on the lateral surface of the humero-scapular articulation. The leg is now extended full length by means of traction and the fetotome is held firmly in place near the articulation while the leg is being amputated. With one leg removed, the added room allows palpating at least partially around the neck. In some cases, mutation can then be performed. If not, an obstetrical chain is passed around the neck and used as a leader to draw the obstetrical wire around this part. This accomplished, the fetotome is threaded and the head and neck amputated as near the shoulders as possible. A chain is then attached around the cervical vertebrae of the amputated portion and the head and neck are withdrawn. The pelvic canal is then well lubricated and the fetus delivered by traction applied to the remaining fore limb. During the delivery the hand of the operator should be used to shield the stump of the amputated leg to insure against injury to the pelvic canal.

II. *Anterior Presentation with Both Fore Limbs Back Along the Body, and the Head Presented in the Pelvic Canal.*—In many of these cases the legs are ankylosed and turned underneath the body. In order to get more room for working in the pelvic canal, the head and about half the neck is amputated and removed with the fetotome. An obstetrical chain is then applied around the vertebrae of the stump and traction applied. Another obstetrical chain is then

worked around one of the fore limbs just behind the elbow. With the chain as a leader, the obstetrical wire is drawn around the leg, the wire is threaded into the fetotome and the leg is amputated near the shoulder and removed. The other leg is similarly amputated after which the fetus is delivered by traction applied to the stump of the neck.

III. Anterior Presentation with Head and One Fore Limb Presented, the Other Fore Limb Lying Back Along the Body.—In these cases the head and neck should be amputated as close to the shoulder as possible and removed. Then by applying traction it is possible to get the fetotome in position around the misplaced leg as previously described. The leg is then amputated and removed, after which the fetus is delivered by traction.

IV. Breech Presentation.—This is one of the common types of presentation we are called upon to deliver, some of them as long as three weeks after the onset of labor. In normal birth, the first stage of labor consists in the contraction of the uterus, resulting in the dilatation of the cervix and the forcing of a part of the fetus into the vagina. During this stage the mare is restless, may get up and down a few times and in general shows colicky symptoms. As soon as a portion of the fetus enters the vagina, the second stage of parturition begins. This is known as the stage of labor in which the abdominal muscles are brought into play in an effort to expel the fetus. In breech presentation, usually the second stage of parturition does not take place, due to the fact that no part of the fetus enters the vagina, thus the stimulus for the second stage is lacking. The owners and even veterinarians who are called sometimes dismiss such cases as "colt colic." In two to three weeks the owner becomes alarmed because the mare is long overdue, and since he may or may not have noticed a slight vaginal discharge or the mare may not be as eager to eat as usual, he decides to have her examined. The examination usually reveals a dead fetus

in a breech presentation undergoing more or less decomposition.

In delivering these an obstetrical chain is passed around the most accessible rear limb in the region of the flank. To do this a handful of the obstetrical chain is placed in the flank between the stifle and body of the fetus, pushing it down as far as possible, then by placing the hand underneath and using the fingers to spread the parts, the chain drops down into the hand. The chain is then used to draw the obstetrical wire around the leg. The wire is threaded into the fetotome and its head placed against the symphysis pelvis for the amputation. When the amputated portion is removed the opposite leg is handled in a like manner. A loop of chain is then placed around the stump of the fetal pelvis and after thoroughly lubricating the canal and fetus, traction is applied and delivery effected. The operator's hands are used to shield the exposed bony portions of the fetal pelvis to avoid laceration during delivery.

V. Bicornual, Transverse, Ventral Presentation.—Wry neck also is commonly associated with this type of presentation. One may find either the fore or hind limbs presented into the vagina with the retained limbs lying parallel to the body of the fetus. In performing embryotomy on these, first amputate both hind legs below the hocks with the fetotome. A chain is then looped around each hind leg above the hock and the hocks are then pushed back into the uterus out of the way. The fore legs are then taken one at a time and as traction is being applied they are amputated as near the shoulder as possible. After this has been accomplished, traction is applied to the chains attached to the hind limbs and the fetus is delivered in posterior presentation. Sufficient lubrication should be used in the uterus around the fetus to insure its slipping into position easily when traction is applied.

There are still other presentations and many variations in position which may be encountered. However, the foregoing are the more common and the embryotomy

methods outlined can readily be adapted to any variation in the presentation.

POSTOPERATIVE CARE

This varies with the condition of the uterus following delivery. If the placenta has not come away it is immediately removed whenever possible. The uterus is then irrigated to remove any putrid or bloody fluid which is present. For this purpose warm normal saline solution or a weak solution of some mild soapy antiseptic is used. Not over a half gallon of solution is allowed to run into the uterus at one time and then siphoned out; this is continued until the return flow is clear. One should be sure that all the solution is drained out following irrigation. A quart of warm mineral and castor oil, equal parts, is then injected into the uterus along with three uterine capsules containing five drams of sodium perborate and ten grains iodoform, which is left in the uterus. The oil soothes the inflamed endometrium, forms a protective covering and prevents putrefaction. In addition, the castor oil stimulates involution. If the uterus is markedly flaccid, 10 cc. of pituitrin may be given. From then on the pulse, respiration and temperature are watched. The majority of cases need no further treatment. Occasionally on the second or third day it is necessary to irrigate the uterus again and inject another pint of the oil mixture. This line of treatment has given excellent results. No cases of parturient laminitis or metritis have developed when treated in this manner.

Medical-Veterinary Coöperation

The general direction in the march of medical science is toward a closer relationship between human and animal medicine. More and more the two are dovetailing with each other, not only as medical science, but also in its application. When the veterinarian is knitting his brow over certain flare-ups in the stable, he is justified in consulting the family physician about health in the home. Moreover, none can be more concerned about the meat- and milk-

inspection service than the physician and there are knowns and unknowns about interchangeable disease between the stable and the home, between the farm and the general population, which are not now being overlooked in the study of medicine.

At the Annual Congress of Medical Education and Licensure (Feb. 17-18, 1941), Executive Dean Ramond B. Allen of the Chicago Colleges, University of Illinois, said in this connection:

The medical profession is indebted to veterinary science for valuable contributions to the knowledge and control of certain diseases in man. The public recognizes the veterinarian for his skill in the care of domesticated animals and fowls. The great industries engaged in preparing meat and meat products for marketing and the government meat inspection service are dependent on veterinary and medical sciences for qualified scientific personnel. Further extension of coöperation between veterinary and medical sciences through the professional societies and schools is desirable.

At the Indianapolis session of the AVMA, Thurman B. Rice, chief of the Indiana state board of health and physical education, said that the coöperation of physician and veterinarian is vital to this civilization.

Inasmuch as the usefulness of medical science to mankind is no doubt benefited by the espousal, the duty of the veterinary profession is to guard well its educational system and its ethics.

From the beginning (1893) certified milk has maintained its position of unquestionable leadership, always setting the standard in sanitary production and in quality far in advance of market milk.—*Certified Milk*.

Reports to the effect that there has been a wholesale disposal of dogs in Great Britain appear to have been exaggerated. The number of dogs licensed in England, Wales and Scotland in 1940-1941 is but 375,279 less than in 1937-1938. The total number licensed in these three countries in the fiscal year 1940-1941 was 2,625,686 as compared with 3,000,967 in 1937-1938. Under war conditions, which naturally diminish ownership of nonessential animals, the decrease is certainly not extreme.

CLINICAL DATA

Chemotherapy has filled more space in medical journals in the past twelve months than during any entire decade of this period.

Nine out of ten persons who once would have died of pneumonia are now saved, thanks to the sulfa drugs, and the serums for each of the 32 types of pneumonia.
—*Science*.

To the diseases which yield sensationally to sulfanilamide, add chick pneumonia. Chicks falling into a stupor from overdosing revive when given sodium bicarbonate.
From Science News Letter.

Sulfapyridine and type-specific serum are lowering the mortality of pneumonia (human) for the first time in a distinctly notable degree. The drop in mortality is reported to be nearly 50 per cent.

The prospect of mass vaccination of the human population against influenza fades because the three or more types of influenza virus are not immunologically identical. Type A virus vaccine, however, offers some hope of reducing the incidence of the disease.

Until the advent of sulfonamides it was rare that a patient survived an attack of bacterial meningitis other than the meningococcal type. Today the situation is different. If tuberculous meningitis is excluded, it is justifiable to state that a patient suffering from any form of bacterial meningitis has at least a chance of recovery.—*J.A.M.A.*, Dec. 6, 1941, p. 1975.

The usefulness of vitamin E in the form of synthetic tocopherol in the treatment of muscular dystrophy is an unsettled question in human medicine.

This is the time of year to be on guard against pregnancy disease of ewes—the time to remember that forced exercise in the open is an excellent preventive.

Sudden changes of diet in laying hens are prohibited among experienced poultrymen. Whether the change is for the better or not, it should be made gradually to prevent a drop in egg production.

In thirty persons up to 69 years old, the darkening of previously gray hairs and the growing of new dark hairs has been achieved by the use of the anti-gray hair fraction (= para-aminobenzoic acid) of the vitamin B complex.—*From Science News Letter*, Sept. 6, 1941.

In order that a county may be classified as a modified accredited area in the Bang's disease campaign, all cattle (except steers) over 6 months of age must have been tested and the percentage of reactors at the last complete test must not have exceeded 1 per cent, nor infected herds 5 per cent, of the total.

Among the new discoveries of the hour are antiseptics made from pathogenic bacteria. Gramicidin, discovered by the Rockefeller Institute and recommended in the treatment of bovine mastitis, and penicillin of British origin, employed for nasal sinusitis in man, are the first two chemicals of this type to be introduced. "Better than sulfanilamide" is the claim made for them.

The presence of *Brucella* antibody in the urine of the human being suffering from brucellosis indicates an unfavorable prognosis.—*Technical Bulletin 177, Michigan State College.*

The isolation of the virus of encephalitis in the brain and spleen of a prairie chicken in Montana supports the belief that barnyard and wild fowls are to a certain extent responsible for transmitting the disease to horses and man.

Discovery of a relationship between equine encephalomyelitis and neurotropic virus infections of man prompts a pediatricist (J. E. Kempf, *American Journal of Diseases of Children*, April 1941) to suggest the vaccination of children against that disease where it is prevalent among horses.

Phenothiazine, administered to 89 children and 9 adults infected with pinworms in doses of 2.5 to 8 Gm. and 6 to 10 Gm., respectively, gave satisfactory results in tests made at the University of Toronto.—*From Canadian Public Health Journal*, xxxii (June 1941), p. 308.

Pig Mortality

In a systematic study of 382 sows of six breeds, the mortality from conception to parturition was 19.9 per cent; from parturition to weaning, 14.6 per cent; and at parturition, 2 per cent. Total, 36.5 per cent. But swine breeding has other obstacles to overcome, for while these 382 sows were bred 1,354 times, only 1,058 pregnancies resulted. That is, conception failed to occur 296 times, or in 21.9 per cent of the chances. Of the total ova which had the chance to be fertilized, but 27.1 per cent were represented by weaned pigs.

The effects of disease and general health on reproduction are discussed and emphasized.—*From Phillips and Zeller, American Journal of Veterinary Research*, Oct. 1941.

Facts About Bull Semen

Dougherty and Ewalt of the Oregon Agricultural Experiment Station (*Am. J. Vet. Res.*, Oct. 1941), in the examination of 645 specimens of semen from 104 bulls, found but little correlation between breeding efficiency and laboratory findings, such as the amount of ejaculate, sperm-cell count and motility, hydrogen-ion concentration of the semen, and percentage of abnormal spermatozoa. There was, however, a correlation between (1) the pH of semen in the first few hours and (2) the motility and viability of the spermatozoa.

The pH of semen taken from the seminal vesicles in the abattoir ranged from 5.65 to 6.33 and it decreased less rapidly in inactivated samples. In highly motile samples the pH decreased more rapidly than in samples of low motility. The diurnal variation of serum was considerable.

The ascorbic acid content of semen in these examinations varied from 0.97 mg. to 8.08 mg. per 100 cc.

Salt for Cannibalism in Chicks

One of the more spectacular mineral deficiencies of animals is cannibalism, feather picking, toe picking, wing picking or tail picking, all of which obviously belong to the same category—sodium chloride deficiency. While salt may not always be a sure cure for cannibalism, it is known that salt deficiency is often the cause of this fatal craving. The salt treatment described by Halpin and Holmes* of the Wisconsin station consists of using a teaspoonful of salt in each gallon of drinking water during a forenoon and repeating the treatment three days later. This is the temporary or immediate treatment to use when the trouble appears. Prevention of the trouble or relapses following the "water cure" consists of feeding mash containing 1.25 per cent salt when the usual ratio of 60 per cent scratch feed and 40 per cent mash is fed. The chick's requirement of salt is about 0.5 per cent of the total ration.

*Bulletin 451, Agricultural Experiment Station, University of Wisconsin, p. 29.

Xerosis conjunctivae, one of the results of avitaminosis A, can be detected early by a biomicroscopic ocular examination but months of therapy is required to effect complete recovery.—*From Public Health Reports.*

Sulfanilamide powder applied topically to infected wounds checks healing but that fault can be overcome to a considerable extent by substituting an ointment of lower concentration containing allantoin after the third or fourth day.—*Ibid.*

In 1941, foot-and-mouth disease in Eire cost the government more than £400,000. There were 556 outbreaks in 13 counties, necessitating the killing of 27,895 cattle, 9,979 sheep, 608 goats and 2,201 hogs.—*From The Veterinary Record.*

The yellow fever mosquito was identified at Jefferson City, Mo., in September. Larvae of the species (*Aedes aegypti*) found in a small aquarium were recognized (as adults) by the state laboratory. The latitude of Jefferson City is 38.6°.

Although other sulfa drugs are more effective in test-tube experiments, none has any advantage over sulfanilamide in actual wound treatment. This is the conclusion of Klepser and Veal of the Gallinger Municipal Hospital, Washington, D. C., based upon the treatment of 5,000 infected wounds.—*Science.*

A common form of cruelty to animals reported by humane societies is neglect of saddle sores in horses rented out by riding stables. Sore backs, sore shoulders and sore necks covered up by saddles, harnesses and collars are not only a source of a great deal of cruelty but also the cause of more days on "sick report" than any other ailment of horses.

Half an ounce of cobalt sulfate in each 100 pounds of salt consumed is sufficient to prevent cobalt deficiency—the newly discovered mineral defect of cattle described by the Michigan State College.

Sulfaguanidine is being tested for its curative properties in trichinosis by workers at the University of Rochester under the auspices of the New York State Trichinosis Commission, headed by State Senator Thomas C. Desmond.

Belzyl benzoate is used by British pharmaceutical producers as the active ingredient of mange (scabies) remedies. The incidence of mange in man and animals runs high under wartime conditions, and concurrently wartime conditions are always prolific sources for new remedies.

Arriving simultaneously but independent of each other are reports of two human cases of psittacosis, one in Washington, D. C., contracted from psittacine birds of the National Zoological Park (*Pub. Health Rpts.*, May 23) and another at Oak Park, Ill., traced to the recent purchase of two love birds, by the state department of health.

Toxicity of Barbiturates

In 20 patients treated with picrotoxin to counteract the effect of barbiturates taken with suicidal intent, Anderson (*Annals of Internal Medicine*, May 1941) found that for best results the treatment must be given promptly. When patients have lapsed into deep depression for several hours, the chances of recovery are lessened. Barbiturates were found to be relatively safe drugs. Serious intoxication was not observed in any case where even twelve times the usual dose was taken. Picrotoxin and metrazol were not employed where the intoxication was mild, as the patients responded to other drugs.—*Abstract, J.A.M.A., Aug. 16, 1941.*

Sulfaguanidine in "White Scours" of Calves*

Sulfaguanidine (= sulfanilyl guanidine), one of the sulfanyl derivatives, is becoming recognized as a therapeutic agent for many enteric infections in man and in domestic animals.^{1, 2} The use of this chemical compound as a medicament for "white scours," an enteritis occurring frequently in animals less than a week of age, has produced encouraging results in all cases we have treated.

This disease, also known as "bacterial scours" or "infectious diarrhea," has not responded satisfactorily to therapeutic agents heretofore employed. Its etiology from a microbiological standpoint is ill defined; its incidence among dairy herds throughout the United States is great, and the mortality is high. Prophylactic methods commonly recommended and generally used frequently fail to prevent this fatal diarrhea.

Five cases of calf diarrhea, definitely diagnosed as the classical "white scours," have recovered miraculously as a result of the administration of several doses of sulfaguanidine in aqueous suspension. Two of these cases had received "anti-coli-enteritidis-pasteurella serum" of bovine origin, but this failed to prevent the disease. Chemotherapy in all cases was initiated immediately after the first positive symptoms of "white scours" were manifested. The dosage schedule per 100 lb. bodyweight was as follows:

No. of dose	Time interval hours	Dosage grams
First	Initial.....	5.0
Second	4	3.5
Third	6	2.5
Subsequent	6	2.5

*Technical Paper No. 87 of the South Carolina Agricultural Experiment Station.

¹Cameron, H. S. and McOmie, W. A.: Blood-concentration studies on sulfanilylguanidine in swine and sheep. *Cornell Vet.*, xxxi (1941), pp. 161-163.

²Levine, P. P.: The coccidiostatic effect of sulfaguanidine (sulfanilylguanidine). *Cornell Vet.*, xxxi (1941), pp. 107-112.

The treatment was continued until the diarrhea definitely subsided, which was usually a short time after giving the third dose. However, in one case only one dose was necessary, whereas in another four doses were required.

The treated calves remained weak and without appetite for about two days following cessation of the diarrhea. In order to provide nourishment to two of the calves during the recuperative period it was necessary to drench them with milk, drawn from their respective dams. Within three days following the sulfaguanidine treatment, no abnormal clinical symptoms were evident. A male calf that had recovered was sacrificed for autopsy, which revealed a slight catarrhal condition of the colon and a small hemorrhagic area in the fundus of the abomasum. Neither of these conditions was considered pathologically serious.

Though these preliminary results from the use of sulfaguanidine as a remedy for this type of scours are promising, much additional information is needed to establish the applicability of this drug in the treatment of various other types of calf diarrhea.—George H. Wise and G. W. Anderson, *Clemson College, S. C.*

The use of biologic products in human medicine has been adversely affected by the popularity of sulfanilamide, according to *The Journal of the American Medical Association*. Whether the extensive use of that drug in veterinary medicine is having the same effect is not known.

Chick embryos are playing a more and more valuable rôle in the study of virus diseases affecting man and animals, the U. S. Bureau of Animal Industry reports, because the membranes of the normal living chick embryos in various stages of development are useful not only in propagating viruses, but also in producing serums and vaccines.

Mammary Rest in Mastitis

W. F. GUARD, D.V.M.*

Columbus, Ohio

Someone has aptly said: "Be not the first to cast the old aside, yet not the last the new to have tried." To try suggests caution, not reckless boosting of something new.

For several years we have advocated rest in treating chronic streptococcic mastitis in cows, particularly when only one quarter is affected. By rest we mean drying up the quarter. Rest serves two purposes: (1) It gives the rest needed and (2) it is practical sanitation and hygiene by preventing spread of the infection to other quarters and other cows, or to the consumer. Milk production of the cow is not seriously impaired since many cows give as much milk from three quarters as they did from four.

I look upon the course and spread of chronic streptococcic mastitis as being comparable to pulmonary tuberculosis. The principle is the same as that employed in treating certain cases of tuberculosis of the lungs by collapsing the affected lung and giving it a period of rest for repair and later permitting the lung to again function normally. It was my original thought to permanently abandon the affected quarter and I still believe this to be practical where there has been a heavy infection and extensive lesions. Dr. J. L. McKittrick who operates a large dairy herd informs me that many of the cases so managed will function in all four quarters after the next parturition.

Quarters affected with mastitis that are injected with certain preparations while lactating will dry up for the remainder of the period of lactation. Some are, therefore, recommending that only dry quarters be treated with such preparations. In that event, one wonders how much credit should be given to the period of rest and how much to the product used.

Practitioners can not afford to abandon

fairly practical treatments for some newly advocated one until the efficacy of such treatment has been established and its limitations determined.

Pulmonary Actinomycosis in a Pointer

"Mike Jr.," a liver and white pointer owned by the Ichauway Plantations of Newton, Georgia, while in training in Manitoba for the national field trials was brought to the hospital. Examination showed a temperature of 104 F., respiration rapid and labored, and the lower half of chest dull on percussion. X-ray pictures showed a definite fluid level.

Diagnosis of empyema with an unfavorable prognosis was given to the trainer.

On postmortem examination the chest was found to contain about two pints of seropurulent fluid floating many granules. The left lung was adherent to the diaphragm and margin of the costal pleura. In the posterior mediastinum there was a nodular mass about the size of a large walnut, with a fibrous interior that became softer towards its periphery. The right lung was adherent to the diaphragm.

Sections of the growth showed well-formed colonies of the ray-fungus.

It is not uncommon to remove "spear grass" and awns of grain from the tonsils of dogs running in grain and heavy clover. Heads of wheat have been found in the bronchi *post mortem*. It is reasonable to presume that some small particle of grass or awn carrying the ray-fungus was breathed into the lung and started the actinomycotic lesion.—R. E. Shigley, D.V.M., Minot, N. D.

Smallpox vaccination may cause false serologic reactions for syphilis. The false, doubtful or positive reactions thus caused may run as high as 16 per cent.—J.A.M.A., Aug. 23, 1941, p. 594.

World War I gave us the hypochlorite treatment of wounds and proved the efficacy of mass vaccination against typhoid fever.

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Fatal Gas Edema in a Dog*

L. R. VAWTER, D.V.M., M.S.

Reno, Nev.

IN RECENT YEARS there have been only two published reports of gas edema in dogs. In but one of these¹ was the identity of the invading anaerobic microorganism established. A short time ago the cadaver of a female dog was presented to this department for autopsy, with the following history. Three days before death the animal was spayed by median-line incision. During the 24 hours subsequent to the operation, dextrose in physiologic salt solution was given subcutaneously in the loose tissue along the costal region posterior to the elbow. About twelve hours before death the attending veterinarian noticed an extensive edematous swelling along the ribs at the site of injection.

Autopsy was conducted about six hours after death and the cadaver was in good condition. The incision was free of discharge or inflammatory changes, the sutures were intact and healing was progressing by first intention. The extensive swelling on the right costal region posterior to the elbow showed gangrene of the skin and upon incision revealed a large cavernous pocket containing a small amount of blood-stained fluid with necrosis of the subcutaneous connective tissue extending from the midcostal region to the sternum. The underlying costal and sternal muscles were not extensively involved, and there was only a small amount of emphysema in the intermuscular tissue. Extension of the gas edema into the thoracic and abdominal cavities or viscera had not occurred.

Gram-stained smears from the lesion fluid revealed a large number of short, truncate, nonsporulating, gram-positive rods resembling *Clostridium welchii* and a few large, gram-positive rods with subterminal spores. Cultures were made from

the lesion fluid and heart blood into media suitable for aerobic and anaerobic bacteria. Growth occurred only in those suitable for anaerobes.

On the basis of morphology and staining, both types of gram-positive rod bacilli seen in stained lesion-fluid smears occurred in the cultures. All cultures were negative for aerobic microorganisms. Separation of the two anaerobic types was accomplished by thrice repeated picking of individual colonies in deep agar dilution shake cultures. On the basis of morphology, staining, cultural features, sugar fermentation and pathogenicity for guinea pigs, the two anaerobic microorganisms recovered were identified as *Cl. welchii*, type II, and *Cl. sporogenes* by the criteria set forth by Hall,² Henry³ and others.⁴

The strain of *Cl. welchii* proved highly pathogenic for guinea pigs. Subcutaneous injection of 0.25 cc. of an 18-hour meat-medium culture into a guinea pig induced an extensive edema which appeared in twelve hours after injection and eventually extended over the entire abdominal and thoracic area with a greenish necrosis of the skin and rupture of the lesion. Death occurred 30 hours after inoculation.

The lesions found in the guinea pig quite closely resembled those observed in the dog, namely: separation of the skin from underlying structures and necrosis of connective tissue with the formation of a large cavernous lesion. *Cl. welchii* was recovered in pure culture from the guinea pig. The strain of *Cl. sporogenes* proved nonpathogenic for guinea pigs.

Several investigators believe that the symbiotic occurrence of the nonpathogenic *Cl. sporogenes* along with *Cl. welchii* or

*From the Department of Veterinary Science, University of Nevada.

¹Love, W. G., Millar, J. A. S., and Rawlings, W. B.: Gas gangrene (*Clostridium welchii*, *B. perfringens*) infection in the dog. No. Am. Vet., xix (Nov. 1938), p. 51.

²Hall, I. C.: Differentiation and identification of the sporulating anaerobes. J. Inf. Dis., xxx (1922), pp. 445-504.

³Henry, H.: J. Path. & Bact., xxi (1917), pp. 344-385.

⁴Reports of the Committee upon Anaerobic Bacteria and Infections. (Special Rpt. series No. 39, H. M. Stationery Office, London, 1919).

other sporulating pathogenic anaerobes exerts a synergistic action and increases the activity and tissue destruction by such pathogens, particularly *Cl. welchii*.

According to the history furnished by the attending veterinarian, the dextrose solution was taken from an original unbroken package produced by a reputable manufacturer. The equipment used in its administration had been boiled and kept in a germicidal solution certainly capable of destroying a pathogen on the order of *Cl. welchii*. In this instance it is presumed that the skin at the site of dextrose infiltration had not been adequately sterilized, and sufficient infection was accidentally introduced to cause a rapidly fatal gas edema.

Dehorning

An editorial in *Our Dumb Animals* (Jan. 1942) pleads that more mercy be shown toward cattle in depriving them of their horns. Calfhooed cauterization of the horn-forming matrix is advised in lieu of the painful amputation of the developed organs. One can and should agree with any suggestion that will abolish dehorning of adult cattle without annulling the excruciating pain of that so-called surgical operation as ordinarily performed.

Unfortunately, however, it is not true that calfhooed dehorning is as effective in increasing docility as the dehorning of the adolescent or adult. Removing its horns makes a coward of the quarrelsome cow while calfhooed dehorning does not shape the disposition. The remedy is compulsory anesthesia for this and other painful operations performed in the course of animal production. Nerve blocking and surgical cleanliness are practical and also economical in dehorning cattle.

The output of typhoid-paratyphoid vaccine from the Army Medical School increased 800 per cent during the last fiscal year. The laboratory facilities have been geared up to produce 1,500,000 doses a week.

New Treatment for Pediculosis: Lethane

Lousiness affects the poorer classes living in insanitary homes. It is difficult to control because of the quick head-to-head spread and the hatching of nits after the louse-ridden head has been cleaned up. One louse can produce 40,000 in two months. Nits have been hard to kill, and a cheap, nontoxic remedy has been lacking.

Promising results are being obtained from the use of lethane (= butyl-carbitolthiocyanate) in deodorized kerosene, preconized by Lloyd P. MacHaffie, M. D., School Medical Officer, Ottawa (Ont.) Public Schools, and signalized by him in *Canadian Public Health Journal* (Dec. 1941, pp. 606-607). The remedy kills the nits and lice immediately. It is applied by hand or spray in such a way as to soak the hair down to the level of the scalp.

The mixture is composed of 5 to 10 per cent of lethane in purified kerosene: cost 2 to 3 cents per head.

The third Brazilian and American Congress of Surgery was held in Rio de Janeiro November 16-20, 1941.

A Happy Idea

A gadget to prevent cows from swishing the tail while milking. It consists of a rubber-covered spring clip that holds the tail to the tendo-Achillis.



—From Science News Letter.

The Technic of the Microscopic Test for Mastitis*

Collecting the Milk Samples.—Remove all dirt from the teats by washing them with a freshly prepared chlorine solution containing at least 400 parts per million of available chlorine. (No other disinfectant has been found for this purpose that is as satisfactory as chlorine.) Use a separate clean cloth for each cow and, after the teats are clean, wring the cloth out and use it to dry the teats. Draw the milk sample into a sterile, corked test tube.

Preparing the Milk Smear.—Incubate the milk samples overnight at 35 to 37 C. (An inexpensive incubator may be made with a light bulb, thermostat, and an insulated box.) After incubation, shake the sample and remove a small quantity of milk, by means of a wire loop, and smear this on a clean glass slide. Milk from several cows may be placed on a single slide. After making each smear, the wire loop must be heated in a flame to burn away the milk residue. When the smear is dry, immerse the slide in xylene two minutes in order to dissolve the fat. Dry the slide and immerse it in 95 per cent ethyl alcohol for two minutes to fix the film. Dry and stain.

Staining the Smear.—Methylene Blue Stain consists of:—

Certified Methylene Blue Powder. 0.3 Gm.
Ethyl alcohol 95 per cent (or
suitable denatured alcohol) 30.0 cc.
Distilled water 100.0 cc.

Dip slide in this solution just long enough to stain the smear to the proper intensity. Rinse slide in water and dry. If the smear is over-stained, it may be decolorized in alcohol.

The Broadhurst-Paley Stain† is recommended. To make this stain dissolve 1 Gm. of methylene blue powder in 200 cc. of 70

per cent alcohol. Add 5 cc. of a 1 per cent basic fuchsin (1 Gm. of basic fuchsin dissolved in 100 cc. of 95 per cent alcohol). Add 3 cc. of aniline and shake well. Add 12 cc. of dilute sulfuric acid (5.7 cc. of concentrated sulfuric acid in 90 cc. of distilled water, then make up to 100 cc. with water). Mix well and filter. To every 100 cc. of filtrate, add 50 cc. of distilled water and shake well. If the stain thickens on adding the sulfuric acid, dilute with distilled water before, instead of after, filtering.

Immerse slide in stain just long enough to stain the smear properly. Rinse in water and dry. This stain is superior to the former, for when properly used the bacteria and body cells are blue while the milk background is pink. With the methylene blue stain, the background is blue as well as the bacteria and body cells.

Examination of the Smear.—Use an oil immersion objective and an ocular combination giving a magnification of at least 800X.

The greatest handicap in the handling of mastitis in dairy cows is the fact that the disease develops to a serious stage without the owner's knowledge of its presence in his herd. The use of the strip cup twice a week would go a long way in detecting the presence of the trouble earlier.—C. C. Dobson, D.V.M., Sixth (Ind.) District Veterinary Medical Association.

The toxicity of the "sulfa" group of drugs, first studied for their effects on the nervous system, is now viewed with considerable alarm for systemic actions outwardly expressed on the skin in the form of eruptions, for toxic cutaneous manifestations which are but signals of deeper trouble.

One of the most spectacular sights in the United States is the African animal section of the Bronx (N. Y.) zoo. It contains 20 kinds of animals in an outdoor setting.

*Prepared by O. W. Schalm, Veterinary Science Division, University of California, Berkeley, California.

†Materials for preparing the stains may be obtained from Braun-Knecht-Heinmann Co., San Francisco, California.

Trauma: A Problem of Small Animal Practice

J. A. S. MILLAR, B.S., D.V.M.

Deal, N. J.

THE PAST 25 years have brought a change in the number and kinds of traumatic injuries necessitating treatment of the higher order. Motor vehicles, fights, falls, gunfire, kicks and collisions are among the main causes.

Abrasions with loss of hair over areas of various dimensions on the head, body or legs vary in severity but, as a rule, are minor. Contusions classify as slight, moderate and severe, each requiring different methods of handling, from no treatment to hospitalization. Fractures about the head, body or limbs are common. Internal injury varies from slight to grave. Open wounds are of frequent occurrence. When inflicted with a sharp object, the margins are clean cut. Blunt objects cause laceration. Puncture wounds from pointed objects, such as ice picks, and gunshot wounds are occasionally encountered.

CARE OF THE INJURED

In caring for injured animals, knowledge of anatomy, physiology and pathology is essential. An understanding of these basic sciences can not be overestimated. They underlie the principles and mechanics of wound treatment. "Pathology is the surgeon's true guide and technics his faithful handmaiden."

When an injured animal arrives, it is often necessary to give it immediate attention owing to its critical condition. The hemorrhage and shock may require prompt treatment and the excited owner or attendant may be a psychologic problem to be handled with tact. One's manner and interest in the injured animal and the way it is handled are all-important to the owner. In this first approach one must be conservative, but only within the range of good judgment, since a radical step may be required to insure the best result.

Shock may be due to the violence or hemorrhage. It may occur in the absence of hemorrhage, but often it is allied thereto. Hemorrhage is arrested as quickly as possible and the shock treated by means of warm clothing, hot-water bottles or electric pads. The temperature may be subnormal and the pain and discomfort may require morphine, atropine or nembutal. Low blood pressure is raised with intravenous injections of glucose (5 to 10%) in normal saline solution. The object is to replenish the lost volume of fluid in the vascular system. Ringer's solution or calcium gluconate solution (2 to 5%) may be employed. Calcium decreases the permeability of blood and lymph and, therefore, slows down the transfer of fluid from the vessels. In human medicine, insulin (8 to 10 units) with saline or Ringer's solution is said to be helpful.

Shock may be primary or secondary, the one occurring immediately, the other several hours later. Surgical shock may or may not be due to improper methods. There are inherent biologic factors which may or may not be preventable at the time of the intervention. At times blood transfusion would be helpful. The ever-ready blood banks now widely employed in human medicine will no doubt come into more general use in small animal practice. The storage of blood banks for emergencies in the small animal hospital is attracting attention and gaining ground. This precaution must be given more thought and a procedure developed in order that it will prove to be of like value in animal medicine.

Although injuries may require no heroic treatment, it is always wise, for the psychologic effect, to give the patient the benefit of pain-relieving treatment and to keep it under observation for 24 to 48 hours to await developments. Pain in a limb is treated with a dressing of glycerin or boro-

glycerin with 1 per cent of phenol or creolin 1 to 2 drams in 6 ounces of glycerin. Such treatment is antiseptic and hygroscopic. It is not advisable to apply heat to injured parts during the first 24 hours, nor is early massage recommended. To prevent or reduce swelling, cold applications are indicated. For wet dressing we use either saturated solution of Epsom salt or Burow's solution (liq. alumini acet.). Adding glycerin to Burow's solution is an improvement. Another excellent wet dressing is a boric-alcohol solution composed of alcohol 25 parts, aqueous boracic acid solution 75 parts and glycerin 10 parts. Glycerin lowers the rate of evaporation.

Open-wound treatment is always carried out under the established rules of aseptic surgery, removing the hair around the edges and foreign material on the raw tissues, débridement, antiseptic flushing, sterile instruments and gloves, draping, etc. The fact that a trauma is or will become infected is not an excuse for careless or indifferent surgical practices. Suturing follows the conventional rules of approximating and draining.

Irrigations of open wounds with hypertonic saline solution (2 to 3%) stimulates osmosis. Carrel-Dakin solution, favorite of many years, gives excellent results.

SULFANILAMIDE TREATMENT

Employed topically, sulfanilamide and some of the related compounds are standard open-wound treatments and they are likewise applied in liberal amounts to the raw tissues before closure. Serious traumatic injuries, even such as compound fractures, treated freely with sulfanilamide crystals often can be closed safely and with advantage without drainage. It has also given us good results both in preventing infection in recent wounds and in the treatment of old and infected ones.

Mayo and Miller¹ prepared a sulfanilamide solution by heating physiologic salt solution to the boiling point and adding sufficient sulfanilamide to make a saturated solution (0.8%). After flushing the wound

cavity with hydrogen peroxide, it is irrigated with this solution. Frequent irrigation aids in controlling infection. Sterile sulfanilamide (1 to 2 Gm.) is dropped into the peritoneal cavity in abdominal operations with resultful effects.

Herrell and Brown² explain that sulfanilamide exerts a local bacteriostatic action and stimulates local resistance to infection. We have found that sulfanilamide internally is an important adjunct to its local use.

Bickford³ reports the use of sulfanilamide in penetrating wounds of joints. With proper surgical procedure good results were obtained. Caldwell⁴ reported gratifying results in the use of pectin-sulfathiazole jelly in the treatment of compound fractures. It eliminated odor and favored healing.

Pfister⁵ found sulfapyridine to be effective in the treatment of wounds, 25 per cent sulfapyridine combined with a mixture of one part of bolus alba and two parts of a combination of amylum and talcum. Wound secretion seemed to have more rapid inhibition with increased granulation and healing. It was concluded that this sulfonamide was well suited for treatment of slow-healing wounds and ulcers having excessive secretion.

Hawkins⁶ in his work on blood concentration following local application of sulfonamide compounds reported that local treatment can be safely reinforced by oral administration. In many cases this is desirable.

DRAINAGE

It is generally essential to provide for drainage because practically all accidental wounds are soiled and, therefore, potentially infected. Drainage facilitates healing and stops infective processes. It may be a wick of catgut, iodoform gauze, plain gauze saturated with an antiseptic oil, or

¹Herrell, W. E., and Brown, A. E.: *Ibid.*, p. 611.

²Bickford, B. J., *Brit. M. J.*, Apr. 26, 1941, p. 627.

³Caldwell, G. A., *Surgery* 9:309, Feb. 1941 (*In Soc. Proc.*).

⁴Pfister, *Munchen. med. Wchnschr.* 88:489, April 25, 1941; *abst. Internat. S. Digest xxxii* (Sept. 1941), pp. 135-136.

⁵Hawkins, *Brit. M. J.*, Apr. 5, 1941, pp. 511-512.

¹Mayo, C. W., and Miller, J. W.: *Proc. Staff Meet. Mayo Clinic*, xv (Sept. 25, 1940), p. 609.

cigarette drain. In the badly soiled wounds of animals rolled in the street, special pains should be taken to prevent anaerobic infections (Love, Millar and Rawlings⁷). On account of this danger, we employ tetanus antitoxin (1,500 units) and gas-gangrene antitoxin in addition to the other preventives.

Hawkins⁸ in experimenting with guinea pigs with gas-gangrene infections found that untreated animals died rapidly, while those treated with sulfanilamide at the time of bacterial introduction were able to survive this infection in a large percentage of cases. Sulfanilamide is absorbed from wounds giving transitory concentration in the fluid of the wound (1,500 mg. per 100 cc.). McIntosh and Selbie⁹ found sulfonamides to be of value in the prevention of gas-gangrene infection in mice. Sulfapyridine was slightly the most effective against *Cl. welchii*, while sulfathiazole was found to be of greater value against *Cl. septicum* and *Cl. edematiens*. Reed and Orr¹⁰ also found sulfonamides an effective aid in gas-gangrene infection. "Oral administration alone gave much less satisfactory results. Introduction into the wound produced a higher concentration in surrounding tissues than in the blood. With sulfanilamide it was confirmed that in oral administration the concentration in the muscles was approximately the same as in the blood. No safe dose by mouth will produce as high a concentration in a wound as a moderate dose applied locally."

In suturing and débridement, the use of silk sutures described by Gadd¹¹ is effective and practical.

Inasmuch as it stimulates healing and quickens the process of repair, ultraviolet rays are helpful in the handling of serious wounds. Though not absolutely necessary, the apparatus required is a useful part of

the hospital equipment.

For prolapse of the eyeball, if enucleation is necessary, we employ the Bemis technic. If treated early, however, we replace the eye by pressure, after incising the temporal canthus if necessary, and keep it in place by suturing the emergency incision and perhaps also the eyelids to prevent the animal from rubbing the eye with its paws.

The more difficult fractures and luxations are handled by the methods of Dibbell, Ehmer, Schroeder, and Stader.

INTERNAL INJURIES

Internal injuries are of fairly frequent occurrence. Our losses from these are high. Autopsies in many cases reveal rupture of the liver or spleen with hemorrhage into the abdominal cavity. Life in these cases can be saved only by radical intervention after an accurate diagnosis is made. Sometimes blood is found in the abdominal cavity in the absence of any breach in the surface of these organs. In chest injury, especially if ribs are fractured, the prognosis is grave. It is favorable only when essential treatment is given. When there is compression or fracture of the vertebral column a diagnosis can sometimes be made by palpating the individual vertebrae or by x-ray examination, both lateral and dorso-ventral views. One should not be too hasty in condemning such animals for if properly treated they may recover.

The shock is treated with salines, glucose and hemostatics intravenously. The latter give gratifying results and should be used as a routine measure in these cases.

AMPUTATIONS

Occasionally one is confronted with the problem of amputating a limb. Despite the fact that this can usually be accomplished successfully, the owner hesitates to approve, owing to the appearance of an animal with an amputated limb. Some veterinarians believe such an animal is not a good advertisement. It is my opinion, however, that the animal's desire to live should

⁷Love, W. G., Millar, J. A. S., Rawlings, W. B., No. Amer. Vet., xix, (Nov. 1939), p. 51.

⁸Hawkins, F. Brit. M. J., Feb. 22, 1941, pp. 265-268.

⁹McIntosh, J., Selbie, F. R., Lancet, Feb. 22, 1941, pp. 240-242.

¹⁰Reed, G. B., and Orr, J. H., *Ibid.*, March 22, 1941, pp. 376-379.

¹¹Gadd, J. D., J.A.V.M.A., xcvi, (Mar. 1940), p. 415.

be considered along with its traits before deciding to destroy it.

Regardless of the various technics of amputation at different points, it is important to calculate correctly the amount of tissue that will be required to cover the stump. The dimensions of the skin and muscle should be approximately equal to $1\frac{1}{2}$ times the width of the leg at the point where the bone is amputated.

In cats the treatment of trauma is much the same as in dogs. For open wounds in cats Milks¹² recommends applications of a mixture of glycerin 10 oz., Epsom salt 20 oz., water sufficient to make 40 oz., and ichthymol and glycerin 20 per cent, or 2 to 4 per cent solution of boracic acid.

In the practice of surgery, fundamental principles are kept uppermost in mind. In the treatment of trauma one should avoid inflicting additional trauma in the handling of the injured or adjacent tissues. As Doyen emphasized, "It is certain that asepsis being absolute, wounds heal much better in proportion to their freedom from contusion during the course of the operative intervention. Integrity of tissues destined to the process of repair depends upon the manual dexterity of the operator and constitutes one of the essential conditions of a satisfactory result of the operation." Good technics lessen the chance of additional injury and decrease the danger of shock, hemorrhage and infection. In practice this means avoiding excessive handling, exposure, separation of tissues and blood loss.

The making of "dead" cavities, the use of harsh sponges, too much tension on sutures, too close spacing of sutures, poor instruments and bad illumination are all factors to be considered in the treatment of wounds. Since infection may be an annoying complication, asepsis, needless to repeat, is a necessity. It prolongs the period of hospitalization, adds to the expense and sometimes injures one's reputation. When infection occurs, it is well to know its cause and its type. The difficulty

of disinfecting skin through and through and the possibility of metastatic invasion from distant foci are acknowledged, but where the technic was precise in every respect, such infections are not numerous. Trauma is a problem that can generally be handled successfully if good judgment is used from the very start.

Phenothiazine in Verminous Gastritis of Sheep and Goats

Experimental tests on the ranges showed that phenothiazine is efficient in killing the stomach worm in sheep and goats. Even when given in large doses no toxic effects were observed. When the dosage was 0.3 Gm. per pound of body weight, all of the worms disappeared in 48 hours, whereas animals receiving 0.2 Gm. per pound of body weight were found to still harbor a few worms, *post mortem*.

Single doses did not kill all of the strongyles and nodular worms. The autopsies showed that some of these were alive. The results against tapeworms and cecal whipworms were negative. In animals turned out after treatment, worm eggs in the feces approached or reached the vanishing point within a week and were present in but small numbers after 55 days. [*Boughton, I. B. Southwest Sheep and Goat Raiser, xi (1940), pp. 32-33. Abst., E. S. R., lxxxv (July 1941), p. 109.*]

Chickens on farms August 1, 1941, numbered about 13 per cent more than a year previous to that date.—*Food Industries*.

Hog production for 1941 is estimated at 83 million head and Secretary Wickard is asking American farmers to produce 91 million in 1942. Swine breeders are assured at least 85 per cent of parity through 1942, or around 9 cents a pound.

Human tuberculosis has become more of a problem in adults and less of a problem in children. In Illinois there are nine deaths from tuberculosis in adults to one in children.—*Illinois Health Messenger, Aug. 15, 1941.*

¹²Milks, H. J., Vet. Med., xxxii, (Nov. 1937), p. 501.

CURRENT LITERATURE

Report of the Montana Livestock Sanitary Board, 1941

A bound copy of the annual report of the Montana veterinary service attests to the masterful handling of animal diseases in that important region of animal production started by the late, lamented M. E. Knowles before the turn of the century and carried through by his no less forceful successor, W. J. Butler who is designated as Secretary, Executive Officer, State Veterinary Surgeon and Director of Laboratories.

The report is bracing because it is the story of a basic industry girded for war. The state's production of cattle, sheep and its crops were not excelled in former years. The calf and lamb crops were never before equalled. The state has approximately 1,500,000 cattle and 4,000,000 sheep, meaning that during the year 600,000 calves and 2,000,000 lambs were born owing to the high health rate. There is some anxiety expressed over the increment since care must be taken not to overstock the farms and ranges. Pursuant to the authority of the Executive Officer (state veterinarian) certain administrative changes were made. Notable among these was closer relationship with the sanitary inspection of the dairy industry by working coöperatively with the state board of health, local health units, agriculture, labor and the industries. The Executive Officer was recently designated Director of Laboratories by the Livestock Sanitary Board.

HORSE DISEASES

Glanders, dourine and scabies of horses were not found during the year, and but one case of periodic ophthalmia was reported. Swamp fever (= infectious anemia) occurs from time to time in certain districts. During the fiscal year there were 279 cases of equine encephalomyelitis with 76 deaths. Inasmuch as the virus has been isolated in man, deer, pheasants, marsh hawks, gophers and prairie chickens as well as in horses, this disease is pronounced one of growing importance. Flies rather than mosquitoes are incriminated as vectors. Mass vaccination with chick-embryo vaccine is advocated.

TUBERCULOSIS

The incidence of bovine tuberculosis is low. Out of 43,013 cattle tuberculin tested only 40 (= 0.09%) reacted, yet constant vigilance to prevent the infection from flaring up from foci of infection still remains. Cattle losing resist-

ance on account of the eradication campaign obviously become more susceptible to the avian type which is prevalent throughout many parts of the United States. The skin lesions found *post mortem* in reacting cattle apparently do not represent true tuberculosis; the acid-fast organism found does not grow on ordinary media.

BRUCELLOSIS

Definite agreement has been made with cattle growers as to plans of eradication, namely: (1) test-and-slaughter method (with indemnities) with or without calfhood vaccination and (2) blood testing with gradual disposal of reactors with calfhood vaccination and without indemnity. Calfhood vaccination is pronounced "a splendid aid under Montana conditions." Specific directions for its use are given. The number of cattle tested in 1941 was 48,450 of which 1,717 (= 3.5%) reacted, and 1,142 (= 2.89%) were marked suspicious.

OTHER CATTLE DISEASES

The diseases of this category listed and commented upon are: coccidiosis, scabies, Johne's disease, anthrax, hemoglobinuria, pulmonary emphysema (asthma), malignant catarrh, screwworms, spinose ear tick infestation, foot rot, tetanus in calves, malignant edema of calves, filariasis, cysticercosis bovis, infectious keratitis, blackleg, and urinary calculi, none of which have been a serious menace. No anthrax, but 6 cases of sarcoptic mange, 1 case of Johne's disease, 1 case of malignant catarrh, are examples of the low incidence of grave maladies in Montana. The danger of spreading animal disease in the absence of a watchful veterinary service was shown by the loss of 600 cattle from screwworms brought into the state with cattle from Mexico in poor condition during inclement weather. [This we believe is the most northerly latitude that the screw-worm pest has been reported.—Ed.]

The appearance of blackleg in vaccinated calves is attributed to depending upon single-dose vaccination in young calves on the recommendation of the producers of the vaccine. Where the disease is virulent revaccination of young calves is recommended.

SHEEP

Gratifying is the report that scabies in sheep has not existed in Montana for 25 years. Worm

parasites are regarded as an ever-existing problem of the sheep grower, but the use of phenothiazine is believed to be a reliable remedy, superior to anthelmintics previously employed.

With the increase of lamb feeding in the state, the usual problems of the feedlot, mainly digestive upsets with bacterial infection and coccidiosis, have to be considered. Pasturing feeder lambs 10 to 14 days before putting them on feed is imperative as an intermediary measure between weaning and heavy feeding. The protozoon, *Globidium gilruthi*, isolated by Marsh, produces symptoms comparable to those of coccidiosis and requires the same treatment.

Hog cholera occurs occasionally where swine are fed infected garbage. It should be placed among the reportable diseases in order that preventive steps may be taken. In 1941, there were but 29 cases of swine erysipelas.

Rabies has not been reported to exist in Montana since 1935.

The veterinary service of the state is rounded out monthly by issuing a monthly letter on the livestock sanitary condition of the state. The letter goes to all licensed veterinarians and members of the Livestock Sanitary Board, and by conducting working laboratories (bacteriological, pathological, chemical) under the direction of the Executive Officer.

Appreciation is expressed for the coöperation of Chief John R. Mohler of the U. S. Bureau of Animal Industry and his able representative G. H. Cronen in maintaining what appears to be a state veterinary service of the upper bracket—none better many have contended. [*Report of the Montana Livestock Sanitary Board by W. J. Butler, Executive Officer, December 1, 1940, to November 30, 1941.*]

Milk Fat Superior to Other Fats

For some unknown reason the fat of milk is needed for the utilization of its sugar. When all of the fat is removed from milk its lactose is excreted instead of being metabolized. Man digests practically all fats that melt at or below the body temperature. In butterfat, lard and olive oil the proportion digested is 97 to 98 per cent. The authors found that butterfat, cod liver oil and halibut oil absorbed more rapidly than other fats. The fact that patients suffering from liver trouble are able to tolerate butter and cream when other fats are not digested is in accord with this observation. The superior nutritive value of butterfat has been proved by experiments on rats and calves. The difference is due to the kind and qualities of the fatty acids which make up the butterfat itself. (*Irwin, Margaret, Bulletin 447, Wisconsin Agricultural Experiment Station.*)

Raw Fish Inactivates Vitamin B

The authors confirm in chicks previous experimental work and clinical observation on avitaminosis B₁ in foxes. It was found possible to produce the deficiency by feeding raw carp to chicks. The data showed that the deficiency can be produced in chicks fed 25 per cent raw whole carp in an otherwise sufficient diet. As in the case of foxes, the danger was removed by cooking, the factor being heat labile. Those fed raw carp entrails developed the polyneuritis earlier than those fed heads, tails and muscles. The condition can be reproduced in foxes that have recovered from a previous attack. *In vitro* experiments proved that inactivation of vitamin B₁ by raw carp occurs in the feed mixture itself and it depends upon the length of time the fish was in contact with the feed mixture. Evidence points to the enzymic nature of the trouble. [*Spitzer, E. H., Coombes, A. I., Elvehjem, C. A., and Wisnicky, W., Inactivation of Vitamin B by Raw Fish, The Fur Journal, viii (Dec. 1941), pp. 3, 5 and 18.*]

Western Equine Encephalitis and Human Encephalitis

In a comprehensive article entitled "Western Equine Encephalitis Occurring Among Human Beings in Western Kansas" the author confirms previously known facts about the identical nature of certain human and animal encephalitis. Of vital significance in this connection is the fatal case of so-called encephalomyelitis in an isolated case in a horse that occurred several weeks after its owner, ill with encephalitis, had returned home from some distance. The patient brought the disease to his farm stables, the evidence appears to show. His blood was positive for the western strain of the virus of the disease.

The author gathered specimens of blood of human cases throughout the state. These were tested by Dr. Lee Roderick of the Division of Veterinary Medicine, Kansas State College, with the result that 50 per cent of the patients (human) tested showed evidence of protection against the western equine virus. Since the St. Louis type of virus has been isolated in certain wild and domestic fowls and horses, the author believes that there may be more of this (St. Louis) virus among horses than is generally known. Investigations carried out in Colorado, Montana and Washington where it was shown that the St. Louis virus produces a disease in horses (experimentally) that is clinically indistinguishable from the disease produced by inoculations of the western strain, confirm the author's belief. A boy 8 years old developed encephalitis and four other patients reacted to the western equine strain of

the virus. The conclusion was that in Kansas 50 per cent positive reactions to equine encephalitis occur in samples of blood taken from human cases of encephalitis. [Wheeler, James A., *J.A.M.A.*, cxxvi (Dec. 6, 1941), p. 1972.]

Pre-Milking in Cows

The milking of cows before calving has its advocates and those who have tried it enthusiastically advocate the practice. One of the objects is to overcome the discomfort of large swollen udders as parturition approaches. Some of the modern herdsmen have their expectant cows milked three to four days or longer before calving, regardless of the state of the udder. It stimulates lactation in cows and heifers that have not "bagged up" and relieves the distress of engorgements. Whether the cow gives one pound or 40 pounds a day, does not matter.

Pre-milking is said to prevent caking of the udder and also milk fever. The sudden mammary readjustment associated with the ordeal of parturition is a severe change. Pre-milking brings about the change gradually. Whether it prevents objectionably pendulous udders is not known. The author is less certain about the value of colostrum. "It is either overplayed or else the antibodies go into the milk at the time of calving" as the calves seem to do well. If thought essential, the milk may be frozen and preserved for postnatal feeding. [From the veterinary column of *Hoard's Dairyman*, Nov. 25, 1941.]

Pizzle-Rot in Sheep

The ovine disease commonly named pizzle-rot in Australia and in this country generally believed to be the venereal form of lip and mouth ulceration was proved to be a virus infection by Tunnicliff and Matisbeck of the Montana station. It has been recognized as a definite entity in the United States during the past 30 years. It affects the prepuce of the male and the vulval lips of the ewe. When the penis is involved, there is but mild inflammation and ulceration unless complicated with the vicissitudes of phimosis or paraphimosis. Although commonly supposed to be due to *Actinomyces necrophorus* the authors reproduced the disease with filtrates, subcultures of which were bacteria-free. The experimental work which lacked nothing in the matter of proper control, opens a new field in the study of venereal diseases. [Tunnicliff, E. A., and Matisbeck, P. H., *A Filterable Virus Demonstrated to Be the Infective Agent in Ovine Balanoposthitis*, *Science* xciv (Sept. 18, 1941), p. 283.]

Casein

Milk contains about 3 per cent of casein, the principal protein of milk, the bases of the curd and the solid of cheese. It is used in making plastics, adhesives, binder for paint, paper coating, dressing for cloth, and textile fibre. The amount produced in the United States last year was 50,000,000 pounds. Wisconsin, New York and California produced 50 per cent of the output. In 1939, the world's output was 174,000,000 pounds of which 41,000,000 pounds came from the United States and 39,000,000 from Argentina. Prior to the war, Germany was the greatest importer of casein. (Ray Huey, *New York Agricultural Statistician*. Abstracted from *Hoard's Dairyman*.)

The American Buffalo (Bison Americanus)

It is difficult to realize that but 75 years ago, millions of buffalos grazed on ground now covered with thousands of fine farms and ranches. These "Monarchs of the Plains" were so numerous that they darkened the landscape. There were buffalo herds that literally covered a hundred miles of prairie 20 miles wide. They could stand the fiercest blizzards and were well fed from self-cured grasses. Natural history has no parallel to these countless ruminants that flourished from the Dakotas to Texas west of the Mississippi previous to the 1870s. Spanish explorers of the 16th century wrote of masses of animals (*vacas*) that compelled them to change their route. In 1804, Lewis and Clark found buffalo so numerous along the Missouri that the party was sometimes unable to land. Howitzers were used to clear the way for Kendall's Santa Fe Expedition of 1841. After the Civil War cavalry fired upon the leaders of the band to prevent being run over. The earth trembled under their weight and momentum. Col. Cody (Buffalo Bill) killed 4,280 in 18 months to furnish meat for railway construction gangs.

The number of buffalos is a fantastic figure. Along a 50-mile stretch of railroad in the Arkansas Valley, 6,250,000 bleached skeletons were counted. These were the salvation of the pioneer farmers who sold the bones at \$20.00 a ton in New Orleans for the purification of cane sugar and the making of fertilizer.

Buffalos were the very life of the aborigines. They furnished their main food and clothing and owing to their numbers were easy to capture. In the absence of means of preservation much of the meat was wasted, and skins were a "drug on the market." By 1900, however, a buffalo coat sold for \$75.00 to \$100.00.

The noted Buffalo Jones (1870s) and later the famous Texas cattleman, Charles Goodnight, were quite successful in crossing buffalo with Poll Angus and Galloway breeds. The offspring were called Cattalos. Owing (it is believed)

to the high incidence of abortion, the nature of which is not known, progress was slow. Unfortunately, the Jones herd of Cattalos was wiped out by guerrilla cattle rustlers in 1911 after years of painstaking cross-breeding on the Kaibab Plateau along the north rim of the Grand Canyon. The buffalo is, however, not extinct, thanks to the governments of the United States and Canada, which carefully guard some 15,000 on protected reservations. The quarterbred, halfbred, three-quarterbred Cattalo is, however, a creature of the experimental past with neither hope nor reason for reviving them. [An article on the Canadian buffalo by Seymour Hadwen, J.A.V.M.A., January, 1942, contains up-to-date data on the subject.—Ed.] [Hartung, A. M. *The American Buffalo, The Cattleman*, xxviii (Jan. 1942), pp. 13-15.]

Institute of Public Service

The need of education in public service is as true today as it was in the time of Aristotle. Government affects all phases of life. In the Chicago area, for example, there are 125,000 public officials or employes. In the whole country there are 170,000 separate local governments with a payroll of around 5 million persons who receive about one fourth of the national income. The rôle of government has, therefore, become crucial in our social life and way of thinking. Like the clergy of former days, lawyers, doctors, technicians and business men have taken over the responsibility of government.

In view of the situation, the University of Chicago has instituted a course in public service open not only to students in pursuit of baccalaureate degrees having the usual entrance requirements, but also to students-at-large admitted with the consent of the appropriate dean. A "Certificate of Public Administration" is granted to those who qualify. A summary of the course and the list of instructors are given. [*Institute of Public Service, Announcements 1941-1942. University College, University of Chicago, 18 S. Michigan Ave., Chicago. 12-page pamphlet.*]

Animals in War

Bombing and shell fire affect the nervous system of dogs and cats as severely as human beings. Since the incurable gun shyness in dogs of all breeds is common in non-sporting breeds, all dogs should be kept under control during raids. On the street control with the leash, in the house confinement to one room, and in the yard chaining, are recommended. Because bombings are usually followed by fire, that phase of danger must be considered. In the panic of a fire dogs and cats will flee into,

rather than out of, their homes.* Prevention is the leash. In burning buildings dogs and cats are protected to a considerable extent by being near the floor where smoke is the least condensed.

The author gives directions for first aid to animals injured in air raids: burns, fractures, wounds and the need of providing shelters for small animal casualties since animals are not allowed in the shelters of the human population. [Blamey, E. R. *Animals in War. The Tailcagger*, iii (Sept. 1941), pp. 11-12.]

*Animals flee back into burning structures from which they have been removed because, psychiatrists say, that has been their shelter.

The Alimentation of Low-Income Groups

In an article, entitled "Enquête sur l'Alimentation des Familles de Petit-Salariés dans la Ville de Québec," the authors emphasize that collective alimentation has attracted wide attention among scientists and others interested in public health. Incessant progress is being made and great public interest has been aroused in that field. Quoting: "Proper diet for man is the most utilitarian of sciences since, except for aggressive pathogens, it assures normal life and normal descendants while defective diet brings about troubles, near or far, which compromise or ruin public health."

In Canada problems of alimentation have received the attention they merit. In the city of Quebec the diets of 76 families earning an average of \$21.44 a week were studied. The groups comprised 391 persons, of which 188 were adults and 203 were children. The intake of calories, protein, fat, carbohydrate, calcium, phosphorus, iron and vitamins A, B₁ and C was computed. The average cost of food for each person per week was \$1.80. Forty per cent of the income of these families was spent for food, but 47 out of the 76 spent less than this average. The conclusion drawn from this interesting investigation was that the caloric and protein intake was satisfactory, but the calcium intake was not sufficient owing to a too low consumption of milk and cheese by the children. The tables and the other details of this study are worthy of attention by those interested in this important line of investigation. [Sylvestre, J. E., and Nadeau, H. (title loc. cit.). *Canadian Public Health Journal*,* xxvii (May 1941), pp. 241-250.]

A Veterinary History of North Carolina

Gradually a veterinary history of the United States is being written. If it comes through provincial contributions to a coming general

*This issue contains articles of the same type for other Canadian cities: Halifax, Toronto, Edmonton.

veterinary history of the country, so much the better, as details readily overlooked by the most searching historian are thus placed in the records and made available to the raconteurs of events belonging to history. A booklet that has just been brought to our notice is entitled "A Veterinary History of North Carolina," edited by Wm. Moore, L. J. Faulhaber and J. H. Brown, published in 1934. Its very first page is full of historic material relating the connections with the veterinary service of that state of such well-known figures as G. A. Roberts, B. T. Simms, Tait Butler, Cooper Curtice, B. F. Kaupp, J. I. Handley, C. D. Grinnel, J. D. Cecil, F. L. Koonce and others of the earlier years of the century and Flowe, Graham (O. H.), Moore (Wm.), Chrisman *et al.* of later years.

An account is given of the Emergency Relief Administration (1934), of tick eradication as early as 1892 and of bovine tuberculosis eradication since 1917, along with other BAI activities carried out in coöperation with the state service. Attempt is made to catalogue all names of veterinarians connected with the service up to the date of publication (1934) and their duties. A revealing but regrettable fact is the ever-present tendency to open the registration act to the admission of new crops of non-graduates. Eight revisions for that purpose were made since 1903, the last in 1931, when three of the total 42 were licensed. Among prominent North Carolinians who located elsewhere were Ashe Lockhart, J. D. Ray, F. H. Suits and Major Wolfe of the Veterinary Corps, U. S. A. Thirty-four practitioners who conduct hospitals are named, as are also those who served as veterinary officers of the World War. Beyond is a brief account of 33 consecutive meetings of the state association, its officers and technical programs. Among the early subjects formally presented were:

The Veterinary Profession and Meat Inspection, by J. A. Kiernan (1908)

The Efficiency of Tuberculin, by N. J. Hartman (1909)

Blacktongue in Dogs, by F. L. Koonce (1910)

In subsequent years preceding the World War the association was concerned with rabies, hog cholera, shipping fever of horses, dourine, foot-and-mouth disease, hemorrhagic septicemia, milk inspection, bacterins, and such other practice problems as colics, pneumonia and scirrhus cord in horses. Proof that the association is history-minded is a paper, entitled "History of Veterinary Practice in North Carolina," read at the session of 1913 by J. W. Petty.

A list of the members (active, lapsed, emigrant, honorary and deceased), of the presi-

dents and secretaries, and of the places of meeting from 1902 to 1934, with a few lines about the state examining board and ladies' auxiliary, end the interesting document. [*A Veterinary History of North Carolina. By Wm. Moore, J. H. Brown and L. J. Faulhaber. North Carolina State Veterinary Medical Association, 1934. Paper. 5½ pages.*]

Instruction on Tire Rationing

This is a booklet on the administration of the tire rationing vested in Local Tire Rationing Boards organized and staffed by the State Defense Council who are groups of non-paid federal agents approved by the Office of Price Administration, operating under authority granted to the President by the Congress May 31, 1941.

The duties of the tire rationing boards are (1) to receive applications for certificates; (2) to issue serially numbered certificates to applicants entitled to buy tires; and (3) to keep records of all applications and file periodic reports to the State Tire Rationing Administrator.

Among those entitled to apply for new tires are (a) physicians, surgeons, visiting nurses and veterinarians; (b) ambulances; (c) fire fighters, police, public health and safety personnel, and mail carriers; (d) regular public carriers of passengers and materials; (e) handlers of essential materials; (f) farmers for implements, trucks and tractors. The booklet goes into all of the details governing the procurement of tires without the omission of necessary information.

It is evident from this document that the regulations are aimed only at unnecessary use of rubber-tired vehicles. [*Instructions for Tire Rationing. By Office of Price Administration, United States of America, Jan. 5, 1942. Government Printing Office, Washington, D. C. Free.*]

In 1940, the 24,276,000 cows in the United States produced 111 billion pounds of milk, enough to fill a train of cars 15,000 miles long.—*From Dairy Digest.*

Fewer than 4.5 per cent of American cows are registered. Of the registered cows, 42 per cent are Jerseys, 39.9 per cent Holstein-Friesians, 1.4 per cent Guernseys and 1 per cent Brown Swiss.—*From Dairy Digest.*

THE NEWS

AVMA Activities

Owing to the duty with which the Association has been charged on the national preparedness program, an effort is being made to enlarge the membership to the height it should have attained long ago. The situation forbids that the number of qualified veterinarians on the roster remain below a reasonable percentage of the total veterinary personnel of the country. Members are therefore requested to seek out non-members and invite them to participate in the national effort. In view of the tremendous amount of work that has been added to the regular routine, a larger and truly representative membership is imperative.

State Chairmen of Veterinary Preparedness Committees

The following veterinarians have been nominated by their respective state associations, or by the executive committees thereof, to serve as chairmen of State Veterinary Preparedness Committees which will work in conjunction with the national Veterinary Subcommittee of the Procurement and Assignment Service. The nominations have been forwarded to Washington for official notification. The state committees have been or are being formed; the complete personnel of these will be published in the March issue of the JOURNAL. The chairmen:

Alabama—R. S. Sugg, College of Veterinary Medicine, Alabama Polytechnic Institute, Auburn.
Arizona—T. B. Jones, 105 Capitol Bldg., Phoenix.
Arkansas—Joe S. Campbell, War Memorial Bldg., Little Rock.
California—Joseph M. Arburua, 26 Fell St., San Francisco.
Colorado—Floyd Cross, Division of Veterinary Medicine, Colorado State College, Fort Collins.
Connecticut—Edwin Laitinen, 993 North Main St., West Hartford.
Delaware—Harry McDaniel, Jr., State Board of Agriculture, Dover.
District of Columbia—A. E. Wight, Bureau of Animal Industry, Washington.
Florida—J. L. Ruble, 1600 North Orange Ave., Orlando.
Georgia—J. M. Sutton, Sylvester.

Idaho—Arthur P. Schneider, 2519 Boise Ave., Boise.
Illinois—A. E. Bott, 1317 Pennsylvania Ave., East St. Louis.
Indiana—Charles C. Dobson, New Augusta.
Iowa—A. R. Menary, City Hall, Cedar Rapids.
Kansas—R. R. Dykstra, Division of Veterinary Medicine, Kansas State College, Manhattan.
Kentucky—Arthur J. Kay, 517 Murray St., Frankfort.
Louisiana—E. P. Flower, Box 24, Baton Rouge.
Maine—P. R. Baird, 52 Pleasant St., Waterville.
Maryland—A. L. Brueckner, College Park.
Massachusetts—Harrie W. Peirce, 100 Nashua St., Boston.
Michigan—B. J. Killham, Michigan State College, East Lansing.
Minnesota—C. E. Cotton, 3145 Portland Ave., Minneapolis.
Mississippi—E. S. Brashier, Box 916, Old Capitol, Jackson.
Missouri—S. W. Haigler, 7645 Delmar Blvd., St. Louis.
Montana—W. J. Butler, State Capitol, Helena.
Nebraska—W. T. Spencer, Livestock Exchange Bldg., Omaha.
Nevada—Edward Records, University of Nevada, Reno.
New Hampshire—R. W. Smith, State House, Concord.
New Jersey—A. W. Smith, 8 Longview Road, Livingston.
New Mexico—S. W. Wiest, Box 75, Santa Fe.
New York—Albert L. Brown, Adams.
North Carolina—William Moore, Department of Agriculture, Raleigh.
North Dakota—R. E. Shigley, 710 2nd St., S. E., Minot.
Ohio—D. C. Hyde, 1700 Arlington Ave., Columbus.
Oklahoma—L. J. Allen, 1610 N. Ellison St., Oklahoma City.
Oregon—Fred W. Lange, 855 Belmont St., Salem.
Pennsylvania—Ernest W. Hogg, 20 Darling St., Wilkes-Barre.
Rhode Island—J. S. Barber, State House, Providence.
South Carolina—R. A. Mays, Room 415, John C. Calhoun State Office Bldg., Columbia.
South Dakota—D. C. Cotton, Beresford.

Tennessee—M. Jacob, University of Tennessee, Knoxville.

Texas—T. O. Booth, 2002 W. T. Waggoner Bldg., Fort Worth.

Utah—W. H. Hendricks, 1419 East 17th South St., Salt Lake City.

Vermont—A. A. Mortimer, 27 Central St., Randolph.

Virginia—I. D. Wilson, Virginia Polytechnic Institute, Blacksburg.

Washington—M. O. Barnes, 203 Federal Bldg., Olympia.

West Virginia—H. M. Newton, P. O. Box 1721, Charleston.

Wisconsin—Walter Wisnicky, College of Agriculture, Madison.

Wyoming—H. D. Port, 304 Capitol Bldg., Cheyenne.

DAVIS, ROBERT W.

704 S. College Ave., Fort Collins, Colo.

D.V.M., Colorado State College, 1935.

Vouchers: James Farquharson and Harry W. Johnson.

DERRER, WALLACE L.

Mt. Carroll, Ill.

D.V.M., Chicago Veterinary College, 1920.

Vouchers: J. G. Hardenbergh and L. A. Merillat.

DORMAN, H. D.

1700 Evans, Fort Worth, Texas.

D.V.M., Texas A & M College, 1938.

Vouchers: M. B. Starnes and W. G. Brock.

ECKERT, ARTHUR F.

3334 W. 62nd St., Chicago, Ill.

B.V.Sc., Ontario Veterinary College, 1931.

Vouchers: F. L. Barrett and F. C. Mau.

FAY, CHARLES P.

RR No. 4, Wenatchee, Wash.

D.V.M., St. Joseph Veterinary College, 1919.

Vouchers: M. O. Barnes and T. R. Myers.

FLORA, W. G.

Chalmers, Ind.

D.V.M., Indiana Veterinary College, 1918.

Vouchers: J. L. Kixmiller and J. F. Roberts.

GOODMAN, L. J.

Norton, Kan.

D.V.M., Kansas City Veterinary College, 1912.

Vouchers: R. F. Coffey and C. W. Bower.

GRIST, E. A.

Box 787, New Braunfels, Texas.

D.V.M., Texas A & M College, 1937.

Vouchers: M. B. Starnes and W. T. Hardy.

HARMEILING, JONATHAN

528 Polk Court, Sheboygan, Wis.

D.V.M., Grand Rapids Veterinary College, 1917.

Vouchers: W. L. Horn and L. T. Donovan.

KADING, E. J.

Gibbon, Minn.

B.V.Sc., Ontario Veterinary College, 1939.

Vouchers: C. W. Olson and John N. Campbell.

KEENE, H. L.

Shabbona, Ill.

M.D.C., Chicago Veterinary College, 1906.

Vouchers: Glen D. Grogan and John D. Reardon.

KLUSSENDORF, R. C.

430 W. Prairie St., Columbus, Wis.

D.V.M., Cornell University, 1931.

Vouchers: V. F. Ziebell and Paul C. Bennett.

KUCHER, PAUL C.

Station Veterinary Hospital, Fort Bliss, Texas.

D.V.M., Kansas City Veterinary College, 1916.

Vouchers: D. M. Campbell and D. B. Leininger.

APPLICATIONS

First Listing

BARDENS, G. W.

Lowell, Ind.

D.V.M., Chicago Veterinary College, 1918.

Vouchers: H. Meade Hamilton and G. E. Botkin.

BECHER, R. J.

New Vienna, Ohio.

D.V.M., Ohio State University, 1939.

Vouchers: W. F. Guard and W. R. Krill.

BRADLEY, O. C.

Fairview, W. Va.

D.V.S., National Veterinary College, 1892.

M.D.C., Chicago Veterinary College, 1901.

Vouchers: J. J. Cranwell and L. A. Merillat.

CAREY, ROY T.

815 Rainier Ave., Seattle, Wash.

D.V.M., State College of Washington.

Vouchers: R. O. Bagley and G. W. McNutt.

CHAMBERLAIN, HERMEL

La Trappe, Que.

École de Médecine Vétérinaire de la

Province de Québec.

M.D.V., University of Montreal, 1938.

V.M., École Nationale Vétérinaire d'Alfort, 1939.

Vouchers: Joseph Dufrense and A. E. Cameron.

COX, HERBERT M.

220 Pondfield Rd., Bronxville, N. Y.

D.V.M., Cornell University, 1924.

Vouchers: C. P. Zepp and A. J. Ackerman.

CRAWFORD, N. N.

2161 Ravenwood Ave., Baltimore, Md.

D.V.M., Iowa State College, 1909.

Vouchers: A. A. Edelin and J. G. Hardenbergh.

- LEVERT, R. M.
374 Victoria St., Lambert Co., Chably, Que.
M.D.V., Montreal Veterinary College, 1933.
Vouchers: J. S. Jasmin and Chas. B. Baker.
- McCAMISH, JOHN N.
2907 Idalia St., El Paso, Texas.
D.V.M., Texas A & M College, 1939.
Vouchers: Weldon M. Couch and James R. Ketchersid.
- McCAUSLAND, E. J.
Brewster, Minn.
D.V.M., Iowa State College, 1926.
Vouchers: R. A. Merrill and John N. Campbell.
- McILLMURRAY, M. F.
Elkton, Mich.
D.V.M., Grand Rapids Veterinary College, 1918.
Vouchers: C. F. Clark and B. J. Killham.
- McMAHAN, RAYMOND L.
4429 Weissner Park, Fort Wayne, Ind.
D.V.M., Kansas State College, 1938.
Vouchers: Edwin J. Frick, E. V. Hover and Charles C. Dobson.
- MANDEVILLE, W. D.
1953 E. 75th St., Chicago, Ill.
D.V.M., Chicago Veterinary College, 1916.
Vouchers: L. A. Merillat and J. G. Hardenbergh.
- MARSHALL, LLOYD A.
403 Federal Bldg., Cheyenne, Wyo.
M.D.V., McKillip Veterinary College, 1911.
Vouchers: F. H. Melvin and C. A. Mitchel.
- MOORE, C. A.
P. O. Box 883, Cheyenne, Wyo.
D.V.S., Grand Rapids Veterinary College, 1911.
Vouchers: F. H. Melvin and C. A. Mitchel.
- NICHOLS, ROBERT W.
Fryeburg, Maine.
V.M.D., University of Pennsylvania, 1941.
Vouchers: Sidney W. Stiles and L. A. Merillat.
- ROBERTS, JOHN J.
406 W. James St., Columbus, Wis.
D.V.M., McKillip Veterinary College, 1917.
Vouchers: L. T. Donovan and C. F. Van de Sand.
- ROGERS, R. L.
P. O. Box 1692, Fort Worth, Texas.
D.V.M., Texas A & M College, 1925.
Vouchers: R. E. Starnes and H. Schmidt.
- ROSE, C. J.
605 E. First St., Ellensburg, Wash.
D.V.M., State College of Washington, 1935.
Vouchers: M. O. Barnes and T. R. Myers.
- SCHMILLE, H. F.
Westboro, Mo.
D.V.M., St. Joseph Veterinary College, 1919.
Vouchers: H. W. Young and L. A. Merillat.
- SCOTT, DAVID C.
Tekamah, Neb.
D.V.S., Kansas City Veterinary College, 1905.
Vouchers: L. A. Merillat and J. E. Weinman.
- SPOONER, A. D.
72 Franklin St., Barre, Vt.
B.V.Sc., Ontario Veterinary College, 1925.
Vouchers: G. N. Welch and A. A. Mortimer.
- STEPHAN, C. F.
5618 Harper Ave., Chicago, Ill.
D.V.M., Iowa State College, 1934.
Vouchers: J. G. Hardenbergh and L. A. Merillat.
- STILL, SEABORN H.
Box 2522, Reno, Nev.
D.V.S., Kansas City Veterinary College, 1911.
Vouchers: Edward Records and Lyman R. Vawter.
- TANNER, WARREN L.
520 N. Jefferson St., Van Wert, Ohio.
D.V.M., Ohio State University, 1932.
Vouchers: J. H. Knapp and P. A. Soldner.
- VEILLEUX, J. M.
73 Pine St., Quebec, Que.
M.D.V., University of Montreal, 1916.
Vouchers: Joseph Defrense and A. E. Cameron.
- VINE, SIDNEY M.
73 W. Merrick Rd., Valley Stream, L. I., N. Y.
D.V.M., Kansas State College, 1938.
Vouchers: Edwin J. Frick and Leo Devine.
- WIRTZ, I. G.
Sugar Land, Texas.
D.V.M., Texas A & M College, 1937.
Vouchers: Frank W. Brundrett and H. Schmidt.
- WOOD, DYAR C.
406 E. Main St., Greensburg, Ind.
D.V.M., Kansas City Veterinary College, 1918.
Vouchers: J. L. Kixmiller and Walter K. York.
- WOODCOCK, JOHN M.
Belle Meade, N. J.
B.V.Sc., Ontario Veterinary College, 1938.
Vouchers: R. A. McIntosh and S. D. Bamber.
- WORMELY, G. M.
State Center, Iowa.
D.V.M., Iowa State College, 1920.
Vouchers: N. L. Nelson and Lew W. McElyea.

Second Listing

- Clarke, Howard E.
Crouse, Arthur Edward
Halverson, Orville J.
Kirby, John Tom
Livingston, Alan A.
Moffat, Geo. Colvin
Simkins, H. R.
Sinclair, Luke R.
Votaw, Floyd

Executive Board Election

The mail balloting for the election of Executive Board members for District 9 and District 2 ended January 3, 1941. The ballots were counted at the Association's office by Drs. W. A. Young and F. A. Anderson, who were selected as the official tellers. The count showed that W. A. Hagan, Ithaca, New York, was elected in District 9 which comprises Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island and Vermont and Wm. H. Ivens (Sr.) of Philadelphia, Pa., in District 2, comprising Delaware, District of Columbia, Maryland, New Jersey and Pennsylvania. The tellers filed the usual certificate of election in behalf of the victors.

Annual Meeting of 1942 Moved from San Francisco to Chicago

At a meeting of the Board of Governors in Chicago on January 24-25, 1942, it was voted to transfer the 1942 convention from San Francisco to Chicago. The decision was based upon reports from the Executive Secretary, who recently met with the Local Committee on Arrangements in San Francisco, and upon full consideration of opinions and information obtained from many other sources. The grave uncertainties facing conventions scheduled for certain sections of the country in 1942, especially restrictions on rail and automobile travel, led the Board to the above decision. The necessity is greatly regretted.

It was deemed advisable to proceed with plans for a meeting in a city accessible to as many AVMA members as possible; there is need for a meeting in order to transact essential Association business and to discuss important professional problems related to the nation's war efforts.

Further announcements concerning dates, etc., will appear in the March JOURNAL.

Status of Veterinary Questionnaire

As indicated in the January JOURNAL, arrangements are now being completed with the National Roster of Scientific and Specialized Personnel which is to collaborate in the questionnaire surveys of physicians, dentists and veterinarians by the Procurement and Assignment Service. The forms are in process of final draft and will be mailed as soon as the printing is completed.

Veterinarians are requested not to write to this or other offices for copies of the questionnaire; they will be distributed to everyone as soon as possible.

Laudable Task of the Poultry Committee

The Special Committee on Poultry Diseases, Cliff Carpenter, chairman, is working on a nationwide plan to aid the USDA in carrying out its all-out food-for-defense program designed to increase the production of eggs for 1942 to an all-time high figure of 700 million dozen over 1941, or 4,200,000,000 dozen.

The proposed plan is based upon effective control of poultry diseases and, owing to the emergency of the situation, the Board of Governors has encouraged and authorized that committee to go ahead with this timely step since it promises to be a valuable contribution to the nation's war effort.

COMING MEETINGS

Virginia State Veterinary Medical Association, Hotel John Marshall, Richmond, Va. February 4-5, 1942. E. P. Johnson, secretary, Virginia Agricultural Experiment Station, Blacksburg, Va.

Missouri, University of, 18th Annual Short Course for Graduate Veterinarians. College of Agriculture, Columbia, Mo. February 10-12, 1942. In cooperation with Missouri Veterinary Medical Association. J. L. Wells, secretary, 1817 Holmes St., Kansas City, Mo.

Louisiana Veterinary Medical Association. Louisiana State University, Baton Rouge, La. February 18-19, 1942. C. M. Heflin, secretary, 2130 Tulip St., Baton Rouge, La.

Colorado State College Short Course for Veterinarians. Colorado State College, Fort Collins, Colo. February 23-26, 1942.

American Animal Hospital Association. 9th annual meeting. Palmer House, Chicago, Ill. April 7-9, 1942. R. E. Ruggles, secretary, 901-19th St., Moline, Ill.

U. S. GOVERNMENT

American Red Cross

The American Red Cross blood collection program is being extended at the request of the Surgeons General of the Army and Navy. Some 200,000 donors will be needed to fill current needs of the military and naval forces. Collection depots at Los Angeles, San Francisco, Denver, Chicago, Detroit, Indianapolis, Cleveland, Cincinnati and Pittsburgh have been set up to augment the supply already being contributed by cities of the East.

Formaldehyde and potassium permanganate for use in the disinfection of chick incubators was given the preference rating (P-87) relat-

ing to insecticides, disinfectants, etc. P-87 to which an A-10 rating is assigned enables the producers of the chemicals to obtain the necessary raw material. Those who produce, package or peddle the finished products are qualified to accept the privileges granted under P-87.

Secretary Wickard Revokes BAI Order No. 276.—The order of the BAI requiring manufacturers to report shipments of certain biological products to the Department of Agriculture was revoked by Secretary Wickard December 24 following protests of producers, retailers and farm organizations. The revocation became effective January 1, 1942. The products involved are: abortion vaccine, anthrax vaccine, blackleg vaccine, laryngotracheitis vaccine, fowl-pox vaccine, ovine ecthyma vaccine, hog-cholera virus, and canine distemper virus. A drug magazine has pronounced the revocation a "great victory for the retail druggist."

BAI Transfers and Personnel News*

Stanley L. Dean from Albany, N. Y. to Augusta, Me. (tuberculosis).
Charles R. Adams, Baltimore, Md. to Knoxville, Tenn. (meat inspection).
Vernon D. Chadwick, Boston, Mass. (brucellosis) to Beltsville, Md. (zoölogy).
Clifton C. Logan, Boston, Mass. to East Berkshire, Vt. (meat inspection).
Monte C. Smith, Boston, Mass. to Little Rock, Ark. (tuberculosis).
Ernest Cohen, Chicago, Ill. to Dubuque, Iowa (meat inspection).
C. L. Whittington, Chicago, Ill. to Dubuque, Iowa (meat inspection).
George N. Glover, Denver, Colo. to Little Rock, Ark. (tuberculosis).
Theo. A. Grayev, Dubuque, Iowa to Austin, Minn. (meat inspection).
Nathan M. Rosenbaum, Dubuque, Iowa to Chicago, Ill. (meat inspection).
Fred E. Gastro, Ft. Dodge, Iowa to Pearl River, N. Y. (virus-serum control).
Sidney A. Berry, Ft. Worth, Texas (meat inspection) to Topeka, Kansas (tuberculosis).
Frank M. Dennie, Huron, S. D. (meat inspection) to Des Moines, Iowa (acting inspector-in-charge).
Carl V. Metcalf, Kansas City, Kan. to Denver, Colo. (virus-serum control).
Mac Rachman, New York, N. Y. to Chicago, Ill. (meat inspection).
Gerald H. McChesney, Ottumwa, Iowa (meat inspection) to Atlanta, Ga. (brucellosis).
Carman A. Towne, Perry, Iowa (meat inspection) to Huron, S. D. (acting inspector-in-charge).

*Parenthesized words indicate the line of duty.

John G. Martin, Raleigh, N. C. to San Juan, Puerto Rico (tuberculosis).

Ralph L. Williams, Richmond, Va. to *ibid.*

Enoch E. Lindburg, St. Louis, Mo. to Sioux City, Iowa (meat inspection).

Otto J. Schrag, Sioux Falls, S. D. (meat inspection) to Perry, Iowa (acting inspector-in-charge).

Floyd E. Wilson, Tuscaloosa, Ala. (in charge meat inspection) to Columbus, Ga. (meat inspection).

Burton R. Rogers, Chicago, Ill. (assistant veterinarian), retired.

Livestock Industry Geared for National Defense

The work of the federal veterinary service in national defense is outlined in a release dated October 24 from which we quote:

"Germany's invasion of the Channel Islands, home of the Jersey and Guernsey dairy cattle breeds, has infected them with foot-and-mouth disease, Dr. John R. Mohler, Chief of the Federal Bureau of Animal Industry, told a joint meeting of the Michigan Veterinary Medical Association and Junior Chapter of the American Veterinary Medical Association at East Lansing. The Islands were occupied in the summer of 1940. Russia's invasion of Finland last year brought the disease to that country, too, Mohler asserted.

"He emphasized the importance of maintaining effective quarantines to protect American livestock from foreign disease, and insure the success of wartime and peacetime food programs.

"Citing the part that the Bureau of Animal Industry is playing in the defense drive, he pointed out that ever since its establishment in 1884, the Bureau through its research, has been "defending" the Nation's livestock against animal diseases. The Federal meat-inspection service of the Bureau also safeguards public health.

"Dr. Mohler stated that the swine sanitation system developed by the Bureau is helping farmers meet Secretary Wickard's call for greater pork production. 'More than half the pigs in the United States,' he declared, 'are now receiving the benefit of this practical system based on veterinary research.' As applied wholly or in part, the system saves thousands of pigs from roundworms and other parasites and diseases associated with dirty hog lots. He likewise cited beneficial developments in controlling hog cholera through a serum-marketing agreement that provides for a large reserve supply and through closer supervision over the distribution of veterinary biological products. These developments pro-

vide better safeguards for the present and future pig crops.

"In the program for dairy products, Dr. Mohler showed how the well-advanced campaigns against bovine tuberculosis and brucellosis (Bang's disease) have made dairy-cattle breeding safer and surer. In addition, eradication of cattle ticks from most of the South has increased the area suitable for commercial production of dairy products.

"Mohler declared that conditions for increased production of livestock products are much more favorable than in previous wartime food efforts, owing to greater use of science in combating losses and enhancing efficiency of animal production."

Army Veterinary Service

Regular Army.—Announcement is made of the appointment of each of the following named captains of the Veterinary Corps Reserve, now on extended active duty at the stations indicated, as first lieutenant, Veterinary Corps Regular Army, with rank from December 13, 1941:

James Clayton McIntyre, Maxwell Field, Ala.
Russell Martin Madison, Chanute Field, Ill.

Captain Russell McNellis is relieved from assignment and duty at headquarters, South Central Remount Area, San Angelo, Texas, and is assigned to duty as a member of the United States military mission at Lima, Peru.

Lt. Colonel Charles O. Grace is relieved from his present assignment and duty at Fort Leonard Wood, Missouri, effective on or about January 20, 1942, and is assigned to the Eighth Corps Area Service Command with station at Fort Clark, Texas.

A group of veterinary officers of the Regular Army was graduated from the 30-day special course given at the Chicago quartermaster depot in November. Some of the instruction received was from specialists in the marketing service of the USDA. Among them were Rob R. Slocum, specialist on dairy and poultry products and W. H. Haskell, a veterinarian of the U.S. Public Health Service. The graduates of this special course were:

Colonel G. W. Fitz Gerald, San Antonio General Depot, Ft. Sam Houston, Texas; Lt. Colonel Stanley C. Smock, Fort Dix, New Jersey; Lt. Colonel James E. Noonan, Chicago, Illinois; Lt. Colonel Louis G. Weisman, Fort George G. Meade, Maryland; Lt. Colonel Harry J. Juzek, Camp Livingston, Louisiana; Lt. Colonel Edward M. Curley, Presidio of San Francisco, Calif.; Lt. Colonel Henry E. Hess, Fort Devens, Massachusetts; Lt. Colonel Charles M. Cow-

herd, Fort Benjamin Harrison, Indiana; Lt. Colonel C. E. Pickering, Fort Benning, Georgia.

Veterinary Corps Reserve.—First Lieutenant Philip W. Tedder is relieved from assignment and duty with the 70th Quartermaster Company, Camp Blanding, Florida, effective on or about December 20, 1941, and is assigned to the First Cavalry Division, Fort Bliss, Texas.

First Lieutenant Albert J. Brandehoff is relieved from further assignment and duty at Fort Knox, Kentucky, and from temporary duty at the Chicago Quartermaster Depot, Chicago, Illinois, effective upon the completion of his present course of instruction, and is assigned to the Air Corps Flying School, Craig Field, Alabama.

First Lieutenant Donald K. Theophilus is relieved from his present assignment and duty with the Twenty-ninth Infantry Division, Fort George G. Meade, Maryland, effective on or about December 15, 1941, and assigned to the Robinson Quartermaster Depot, Fort Robinson, Nebraska.

Captain Harry H. Emerson is relieved from his present assignment and duty at Camp Grant, Illinois, and assigned to field headquarters, Office of the Quartermaster General, Chicago, Illinois.

First Lieutenant Ernest St. J. Watkins is relieved from his present assignment and duty at Fort Douglas, Utah, effective on or about December 20, 1941, and assigned to the 68th Quartermaster Troop, Fort Ord, California.

First Lieutenant Philip C. Manley is relieved from his present assignment and duty at Fort Knox, Kentucky, effective on or about January 1, 1942, and is assigned to the Ninth Corps Area Laboratory, Fort Lewis, Washington.

Captain Howard L. Kester is relieved from his present assignment and duty at the Chicago Quartermaster Depot, Chicago, Illinois, effective on or about January 15, 1942, and is assigned to the First Armored Division, Fort Knox, Kentucky.

First Lieutenant Theodore Kragness is relieved from his present assignment and duty with the Chicago Quartermaster Depot, Chicago, Illinois, effective on or about January 14, 1942, and is assigned to station complement, Drew Field, Florida.

Major Buell S. Law is relieved from his present assignment and duty with the Fifth Infantry Division, Fort Custer, Michigan, and is assigned to the Chicago Quartermaster Depot, effective on or about January 1, 1942.

Major Michael Shipley is relieved from his present assignment and duty at the Chicago Quartermaster Depot, and is assigned to the

Fifth Infantry Division, Fort Custer, Michigan, effective on or about January 1, 1942.

The following officers are relieved from present assignment and duty with the 67th Quartermaster Company (Refrigeration) at Camp Shelby, Mississippi, effective on or about January 25, 1942, and assigned to the Chicago Quartermaster Depot, Chicago, Illinois:

First Lieutenant Thomas W. Lennon, Jr.

First Lieutenant Glenn M. McFadden.

Announcement is made of the following promotions:

To Major:

Captain Frank Wright Crawford. Dec. 9, 1941

To Captain:

1st Lt. Aaron Francis Allison. Dec. 11, 1941

1st Lt. Grant Fuller Cottrell. Dec. 11, 1941

1st Lt. James Randle Ketchersid. Dec. 16, 1941

1st Lt. Robert Leon Willis. Dec. 17, 1941

1st Lt. Wilfred S. Bentham. Dec. 18, 1941

1st Lt. Blakey Thatcher Deal. Dec. 18, 1941

1st Lt. Orlen Leighton Bailey. Dec. 19, 1941

1st Lt. Norman H. Stoner. Dec. 23, 1941

1st Lt. Douglas Fleming Watson. Dec. 24, 1941

The following veterinary Reserve officers have been ordered to extended active duty by the War Department during the month of December and assigned to stations indicated:

First Lieut. Howell Douglas Miller, Army Medical Center, Washington, D. C.

First Lieut. Mulford C. Lockwood, Chicago Quartermaster Depot.

The following officers of the Veterinary Corps Reserve, now on extended active duty at the stations indicated, have been ordered to report to the commanding officers, Chicago Quartermaster Depot, Chicago, Illinois, for temporary duty for a period of thirty days for the purpose of pursuing a course of instruction, commencing on January 5, 1942, in the inspection of meat, meat-food and dairy products, under the Depot Veterinarian. Upon completion of this duty each of the officers indicated will return to his proper station.

First Lieut. Thomas E. Brown, Headquarters First Corps Area, Boston.

First Lieut. Gerald A. Faatz, Fort Tilden, N. Y.

Major Herbert L. Armstrong, Headquarters Third Corps Area, Baltimore, Md.

First Lieut. Walter J. Jones, Fort Brady, Mich.

First Lieut. Leon D. Johnson, Fort Leonard Wood, Mo.

First Lieut. Lon E. Foote, Air Corps Basic Flying School, Waco, Tex.

First Lieut. Wiley H. Horn, Fort Sill, Okla.

Captain Boyd Jeffers, 4th Cavalry, Fort Meade, S. D.

First Lieut. James H. Clements, 9th Cavalry, Fort Riley, Kan.

Lieut. Colonel Joseph M. Curry, 43rd Division Camp Blanding, Florida.

Lieut. Colonel Loy J. Lauraine, 36th Division Camp Bowie, Texas.

Captain Frank Lucich, 98th F. A. Battalion, Fort Lewis, Wash.

First Lieut. Wilfred M. Crow, 11th Cavalry, Camp Lockett, Calif.

First Lieut. Robert L. Hummer, Advance Flying School, Dothan, Ala.

First Lieut. Joseph A. Farney, Fort Benning, Ga.

First Lieut. Wayne W. Boyd, Fort Thomas, Ky.

First Lieut. Jean A. Flanigan, Seattle General Depot, Seattle, Wash.

Captain Philip A. Sollomi, 4th F. A., Fort Bragg, N. C.

First Lieut. Ben S. Huston, 97th F. A., Fort Bragg, N. C.

Major Roscoe Hyde, Headquarters 5th Armored Division, Fort Knox, Ky.

Mingle Goes to England

C. K. Mingle (O. S. U. '30) of Dr. Eichhorn's staff, Animal Disease Station, Beltsville, Md., has flown to England to work in coöperation with the veterinarians of the British Ministry of Agriculture in the production of *Brucella* vaccine for cattle, pursuant to plans adopted during Dr. Eichhorn's visit to England last fall. The initial objective is to maintain milk production at a high level in the British Isles, by profiting from American experiences in the making and use of strain 19 of *Brucella abortus*.

Active Immunization of Military Animals Against Tetanus

Col. R. A. Kelser, in command of the Veterinary Corps, calls attention to a War Department order dated April 17, 1941, directing that all military animals shall be immunized against tetanus. The order, identified as AG 728, was addressed to all commanding generals of the corps areas, commanding officers of exempted stations, commanding generals of all armies and all chiefs of arms and services. It reads as follows:

"1. Tetanus is a common and serious complication of wounds and injuries in horses and mules unless antitoxin is administered at the time of injury or the animals are previously immunized through the use of tetanus toxoid. Once the disease develops the mortality rate is exceedingly high.

"2. It has been determined that a very substantial immunity to tetanus can be de-

veloped in both man and animals through the administration of tetanus toxoid, a biological agent prepared from cultures of the tetanus organism. In contrast to the very transient immunity produced by the administration of tetanus antitoxin, the protection resulting from the toxoid injections is of an enduring type, usually lasting several years. Further, when immunity starts to wane in animals which previously received toxoid it can be rapidly enhanced by the administration of a small 'booster dose' of toxoid. Tetanus toxoid has been extensively used, with excellent results, for the immunization of soldiers and animals in European armies.

"3. The War Department has approved a plan for the Veterinary Corps to actively immunize all horses and mules in the military service against tetanus through the use of tetanus toxoid.

"4. It is desired that the immunization of army animals at various posts, stations, and camps be commenced as soon as practicable. In this connection, however, the administration of the tetanus toxoid should not follow encephalomyelitis vaccination closer than 30 days.

"5. The immunization process involves the subcutaneous injection of two 10-cc. doses of tetanus toxoid with an interval of 6 weeks between doses.

"6. Requisitions for the tetanus toxoid will be forwarded by Corps Areas Surgeons' Offices to the Medical Supply Depot to be indicated by The Surgeon General.

"7. Notation will be made on the upper right hand corner of the Horse (Mule) Record Card, Form 125, Q.M.C., of each animal immunized, indicating the date each dose of tetanus toxoid was administered."

By order of the Secretary of War, E. S. Adams, Major General, the Adjutant General.

AMONG THE STATES

Canada

Retail druggists are finding it a hardship to keep the retail price of drugs below the price ceiling set by the Wartime Price Trade Board. They are caught between the present high price of drugs and the low price to which they adhered when the price fixing first went into effect. A United States official on price fixing is in Canada gathering information on the effect of "ceiling" on different lines of business. Disparities are regarded as serious and the aim in both countries is to iron them out.

Florida

Famous Reptile Institute.—Herpetologist Ross Allen's reptile institute at Silver Springs estab-

lished a new laboratory which was formally dedicated with appropriate ceremonies January 15. President James Elliot Mooney of the University of Tampa described Dr. Allen as one of the great men of science for his work on snake venom now used extensively in the treatment of nervous disorders: epilepsy, neuritis, certain rheumatic conditions and as an analgesic for patients suffering from the pain of cancer.

Illinois

More Soybean Protein Needed.—The Soybean Research Laboratory of the United States Department of Agriculture at Urbana, Ill., is working on a new process for increasing the production of soybean protein to supplement the increasing demand for casein in the industries. The supply of casein for industrial purposes is decreasing on account of its increasing demand for food. It is estimated that 10,000 tons of soybean protein will be needed annually to supply the demand, which is three to four times the amount produced.—*From Certified Milk, Sept. 1941.*

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The Chicago Association.—The January meeting of the Chicago Veterinary Medical Association at Hotel Sherman, Tuesday evening of the 13th, together with the usual card party for the ladies was featured by talks on postmortem inspection of poultry under the Bureau of Home Economics by M. A. Sweeney; tuberculosis in poultry by A. G. Misener who was a poultry specialist before entering small animal practice; anti-cruelty work in poultry by W. A. Young, director of the Anti-Cruelty Society; and the relation of the veterinarian to poultry production by Secretary Elwood.

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The State Association.—Secretary Hastings announces the following features of the Association's 60th annual meeting at Springfield, January 22-23, 1941. The guest speakers from out of the state announced are:

Thomas P. Crispell, Parsons, Kansas: Sheep Practice.

R. E. Lubbehusen, Purina Mills, St Louis, Mo.: Clinical Diagnosis of Some Nutritional Deficiencies.

E. S. Weisner, poultry pathologist, Michigan State College, East Lansing, Mich.: Common Diseases of Poultry.

H. W. Jakeman, president of the American Veterinary Medical Association, Boston, Mass.: Influence of the AVMA on the Past, Present and Future of the Veterinary Profession.

R. C. Klussendorf, Columbus, Wis.: Mastitis and Other Udder Troubles.

James Farquharson, head, Department of Surgery, Colorado State College, Ft. Collins, Colo.: Surgical Procedures in

Large and Small Animal Practice (Illustrated).

F. W. Wood, Cutter Laboratories, Berkeley, Calif.: Studies on Hog-Cholera Tissue Vaccine.

The state group of contributors, and guest speakers not of the veterinary profession, were:

C. E. Fidler, chief veterinarian, Springfield; Mr. George A. Fox, superintendent of animal industry, Springfield; H. J. Shaugnessy, M. D., Department of Public Health, Springfield; C. N. Bramer, Evanston; H. L. Moser, Pontiac; R. O. Nye, Buda, and H. R. Hester, Farmer City.

Except for the much neglected horse and mule, the subjects are well apportioned among the animals of the farm and home.

On the heel of the printed program comes a No. 10 gelatine capsule from Master-of-Ceremonies W. B. Holmes enclosing a document labeled "Dope" which tells all about his annual terpsichorean entertainment.

The officers of the Association are: D. E. Sisk, Mansfield, *president*; W. C. Glenney, Elgin, *vice-president*; C. C. Hastings, Williamsville, *secretary*. The executive board is composed (besides the president and vice-president who are *ex officio* members) of R. M. Carter, Alexis; C. A. Henley, Jacksonville, and L. E. LeCroy, Fairfield.

Iowa

"Alas, the Horse!" is a headline of an article in the Cedar Rapids Gazette telling about the Marion Dairy Company of that city replacing their delivery trucks with horse-drawn wagons and of others likely to follow suit. The article carries the picture of a fine horse barn and a small band of horses pawing anxiously in the snow waiting to be drafted into the fight for freedom. The trouble is, and we quote, "there ain't any buggies and there ain't many horses."

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R. A. Menary of Cedar Rapids has been chosen chairman of the state preparedness committee which as in the other 48 states is being organized by the AVMA board in the national Procurement and Assignment Service, along with similar committees of the medical and dental professions. The appointment was made by H. D. Bergman of Iowa State College whom the government has officially designated to represent the 8th Corps Area in the preparedness program. The committee is expected to include Chief Veterinarian C. C. Franks and J. A. Barger of the BAI.

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Cedar Valley Association.—Forty-nine veterinarians from 16 counties and 3 states, a physician, a minister, and an attorney attended the monthly dinner-meeting held at Black's Tea Room in Waterloo, January 12.

Joe W. Giffie, Cedar Rapids, federal hog-cholera inspector, conducted the literary program. Doctor Buckmaster (M.D.) of Dunkerton; his son, Attorney Buckmaster of Waterloo; the Rev. Brayshear of Independence; E. W. Burke, federal inspector-in-charge of meat inspection at Waterloo and M. E. Howell, Topeka, Kan., participated.

Secretary R. E. Elson of the Eastern Iowa association explained the purpose of the Government's Procurement and Assignment Service in its relation to proper care of livestock "for the duration." V. C. Willis, Waucoma, Ia., was named representative of the Cedar Valley association on the State Veterinary Subcommittee, under the leadership of A. R. Menary, Cedar Rapids, state chairman.

Iva Dunn described his latest moose hunt in the wilds of Ontario in company with L. F. Barrett and Mr. Don Abernathy of Cedar Rapids.

C. C. Graham of Wellsburg talked on the Iowa Stallion Registration Law and the matter was discussed under the leadership of C. E. Juhl and C. B. Strain.

Captain Russell McNellis of the Veterinary Corps, U. S. A., gave a talk on the Remount Service and on types of mares and mules most desired for army use for cavalry, artillery, and pack trains. He also showed a series of moving picture reels taken in the Philippines, China, and Hawaii, some of which were recent.

President C. L. Moles of Dike, Ia., named H. S. Lames and F. E. Brulsman as the program committee for the march meeting in Waterloo. The February meeting was skipped owing to the proximity to the annual meeting of the State Association to be held at Des Moines, Jan. 28, 29, and 30.

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Eastern Iowa Association.—President Jerry Wolfe called the Executive Board into session to plan for the 1942 meeting which will be held in Cedar Rapids October 13-14. . . . In the interest of wartime economy, the annual practitioners' picnic will not be held this year. . . . President-Elect W. W. Dimock of the AVMA will be the main speaker of the meeting. . . . The all-year reporting of the location of epizootics of livestock and the press service will be continued. . . . Frank Wilson, member of the Executive Board of the national association was named as member of the subcommittee on procurement and assignment for the Seventh Corps Area to work in connection with State Chairman A. R. Menary. The Policy Committee named for 1942 is: J. C. Glenn, *chairman*, C. E. Hunt, C. B. Strain, J. W. Griffith, G. C. Bevan and C. G. Moore. The Advisory Committee for the year is: Wm. S. O'Brien, *chairman*, W. A. Moeller, *secretary*, R. J. Kleinick, L. A.

Bowstead, J. W. Pirie, H. V. Lewis, J. J. Strandberg, J. F. McCabe, F. J. Crowe, and F. L. Roach.

New York

New York City Association.—The December (1941) meeting was held at Hotel New Yorker on the evening of the 3rd. Olive McKay, Cornell University, spoke on canine nutrition. H. Stark reported on a case of entropion in a cat and R. W. Gannett on the use of sulfanilamide in the treatment of infected wounds in cats. The officers elected for 1942 were: C. E. DeCamp, *president*; B. J. Finklestein, *vice-president*; C. R. Schroeder, *secretary-treasurer*. The following were elected to the Board of Censors; Sol Shapera, *president*; E. R. Cushing, S. H. Appleby, W. Ulmer and S. H. Shindell.

J. J. Merenda, Secretary.

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Cornell Conference.—Cornell University's 34th Annual Conference for Veterinarians was held January 7-9 at the New York State Veterinary College, Ithaca, with 300 veterinarians in attendance. The first day was devoted to small animals; the second to general practice, and the last day to large animals. Among the featured topics were large animal nutrition, calfhood vaccination for brucellosis, and the use of "sulfa" drugs. The following papers were presented:

"Heart Disease in Dogs," by H. C. Stephenson; "Trauma: Medical and Surgical Problems in Small Animal Practice," by J. A. S. Millar, Deal, N. J.; "Biochemistry in the Diagnosis of Diseases of Small Animals," by C. E. Hayden; "Recent Developments in the Control of Avian Coccidiosis by Chemotherapeutic Agents," by P. P. Levine; "Diagnosis and Treatment of Diseases of Wild Animals in Captivity," by L. J. Goss; "Canine Distemper," by Charles A. Evans; "Some Newer Drugs," by H. J. Milks; "Hormone Actions in the Animal Body," by J. A. Dye; "The Professional Man's Business Records and the Income Tax," by T. B. Maxfield; "The Effect of the Rearing Environment upon the Incidence of the Avian Leucosis Complex," by C. W. Barber; "Diseases of Feeder Lambs," by Frank Thorp, Jr., of East Lansing, Mich.; "New Facts on Vitamins for Farm Animals," by L. A. Maynard; "Sulfapyridine in the Treatment of Diseases of Calves," by D. H. Udall; "Abnormal Flavors in Milk," by Paul F. Sharp; "Diseases Causing Encephalitis in Cattle," by S. H. McNutt, Ames, Iowa; "Essentials of a Good Calfhood Vaccination Plan for New York," by R. R. Birch; "Monthly Examinations for Controlling Bang's Disease, Mastitis, and Sterility in Dairy Herds," by C. H. Case, Akron, Ohio; "A Filterable Virus from Pneumointeritis (Bronchopneumonia) of Calves," by J. A. Baker, Princeton, N. J.; and "Diseases of the Tendon Sheaths," by J. N. Frost.

The Cornell University Alumni Association held its annual dinner and meeting with approximately 250 in attendance. The Association presented the University with a portrait of Prof. H. J. Milks. The presentation on behalf of the alumni association was made by Dr. F. W. Andrews, and President E. E. Day accepted the portrait on behalf of the University. The portrait will take its place in the Veterinary College Library with seven others the alumni has had painted.

The second afternoon of the program was devoted to: small animal hospital problems; poultry diseases, dairy and milk inspection sheep diseases, horse diseases and nutritional problems. These discussions were substituted for the clinics. From the way they were accepted it seems possible that the experiment will be tried again.

The conference banquet, held on the second evening, was a testimonial dinner to Prof. D. H. Udall who retires from active duty in June. Dean Hagan in behalf of the College and Drs. C. H. Case, R. R. Birch and George H. Hopson, long time acquaintances and associates, felicitated the honored guest for his long and distinguished service.

W. S. Stone, Reporter.

New Zealand

Group Veterinary Service in New Zealand.—Secretary R. B. Westwater of the Morrinsville (N. Z.) District Veterinary Association writes for help in procuring veterinary personnel for that society. New Zealand is an important food-producing country and has lost some of its veterinarians to the military service. The pay is £500 (equals \$2,500) a year and expense of travel amounting to 4d (equals 8 cents) per mile. Recent graduates will be considered.

The Morrinsville Association is a society of 700 farmers owning 55,000 cows. The members pay a stipulated annual fee, graded according to the number in their herd and in order to prevent unnecessary calls they pay a stated fee into the association's treasury for each call made to their farms. The membership fee is £1.10 for 25 cows plus 1 shilling per cow above that number. Grazers pay £2.10 per annum. The letter announcing this position is dated November 21, 1941, which was before the United States declared war on the Axis countries, and had set out officially to canvas the veterinary profession for available qualified men to meet the country's needs.

Anyone interested in the position mentioned may address R. B. Westwater, Morrinsville, N. Z., for details (air mail for prompt delivery).

In view of the widely publicized shortage of veterinarians in our civilian and military service, the vast areas where there are no veterinarians at all, and the well-known difficulty of

obtaining assistants in established hospitals, the hope of aiding our colleagues across the equator is meager.

The letter is significant, just now. It emphasizes a current thought not generally weighed—the work of the veterinary profession.

Wisconsin

State Association.—The Wisconsin Veterinary Medical Association met at the Park Hotel, Madison, Wisconsin for a two day session on January 6 and 7. The extreme cold weather circumscribed the attendance somewhat, although there was representation from every section of the state. About 125 veterinarians attended the banquet; a number of ladies were present and the banquet entertainment was on its usual high plane. Dr. J. S. Healy functioned as Master of Ceremonies, and the guest speaker was W. R. Davies, President of State Teachers' College, Eau Claire, Wisconsin. Mr. Davies gave an excellent address, interspersed with lively humor, but still carrying a serious message apropos of the times. Dr. W. D. Pouden and Dr. W. Wisnicky, both of the University of Wisconsin. Dr. Frank Breed of Lincoln, Nebraska, and Dr. A. H. Quin of Des Moines, Iowa, gave excellent papers.

Limited information naturally circumscribed any activities in regard to Committees on Procurement and Assignment in connection with veterinary service for Civilian and Army apportionment; however, limited information was furnished and a committee appointed to act in conjunction with the Corps Area Committee when requested. Dr. W. Wisnicky was selected as State Chairman.

Officers elected at the meeting were: President, Dr. Jas. B. Wilson of St. Croix Falls; Vice-Pres., Dr. Leo T. Donovan, Waupun, Wis.; Secretary, Dr. B. A. Beach, Madison, Wis., and Treasurer, Dr. W. L. Richards, Morrisonville, Wis.; Trustees, Drs. L. L. Robertson, Argyle, W. L. Horn, Valders, and C. M. Heth, La Crosse.

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Central Association.—The Central Wis. Veterinary Medical Association held their regular meeting at Eau Claire, Wis., on December 10th; fifty members were present and a very fine banquet program was staged. Dr. J. S. Healy acted as toastmaster and Dr. V. S. Larson, Director of Livestock Sanitation, reported on the activities of the U. S. Livestock Sanitary Board meeting in Chicago; Dr. W. Wisnicky of the Veterinary Science Department, University of Wisconsin, gave an excellent paper on: "Reproductive Diseases of Cattle," Dr. W. D. Pouden of the Wis. Department of Agriculture gave a talk on "Udder Physiology

and Mastitis," and Dr. B. A. Beach, Director of Veterinary Science, U. of W., led the discussion on Mastitis. In the afternoon there was an excellent clinic at the hospital of Dr. G. B. Wrigglesworth. The equine and bovine clinic was in charge of Dr. O. C. Selby, Mankato, Minn., and Dr. W. F. Nolechek of Thorp; the canine clinic was in charge of Dr. C. M. Heth of La Crosse.

DEATHS

J. P. Bushong (U. P. '06), 68 years old, native of Pennsylvania, who died in Los Angeles January 5, 1942 after a prolonged illness, was a prominent California veterinarian for many years in key positions related to public health. He was a member of the American Public Health Association, active in the affairs of the Pacific Slope Dairy Association, participated in local veterinary society work, and was the veterinarian in charge of certified milk production in Los Angeles County when overtaken by ill-health. His membership in the AVMA dates from 1916.

John J. Lintner (C.V.C. '08), inspector-in-charge of bovine tuberculosis eradication in Illinois for the U. S. Bureau of Animal Industry, died at his home in Chicago, January 1, 1942. Quiet, unassuming and capable administrator and unceasing attention to duty are the personal attributes his colleagues will recall and long remember. He was a member of the AVMA from 1918 to 1926.

Geo. D. Homan (U. P. '15), Berlin, N. J. A survey of veterinarians of the United States, reveals that his death occurred in 1940.

C. A. Raque, 72, (N.Y.S.V.C. '03) retired field veterinarian of the BAI since 1933, died at his home in San Diego, Calif., May 20, 1941. His last assignment was in Arizona on bovine tuberculosis eradication work.

George C. Mawer, 69, (O.S.U., '92), retired BAI veterinarian died at his home in Lakewood, Ohio, August 16, 1941. He was engaged in meat inspection at Cleveland for many years. He joined the Association in 1915.

Wallace W. Boggie, 46, (Iowa State, '21), World War Veteran (AEF), died at the Bethany Hospital, Kansas City, Kansas, Sept. 21, 1941 after a short illness. He was assistant inspector in charge of meat inspection at Kansas City, Kans., at the time of his death. After graduating Dr. Boggie practiced at Clemons, Ia., until he joined the BAI force in 1932. He was transferred to the Kansas station in April, 1941 from Madison, Indiana where he was serving as inspector in charge.

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50 cc.	3.00
5-50 c.c.	12.50

(Each dose is accompanied by a polished brass tag and vaccination certificate.)

Each Serial Lot of Rabies Vaccine
Is Safety-Tested on Dogs

Free Helps—

- 1 An entirely new booklet free of advertising, to tell your clients the Rabies vaccination story.
- 2 Postcards of two types—one emphasizing the importance of vaccination, the other reminding dog-owners that it is time to revaccinate their pets.
- 3 Large wall poster, 19x25 inches, to attract the attention of your visitors and arouse their interest in Rabies vaccination.

Personalize your service

With Special Tags and Certificates Bearing Your Name



Write for complete information regarding prices on personalized tags (other designs also available) and certificates—or see the full-page advertisement on page 25 of the January-February (1942) issue of the *Jen-Sal Journal*.

JENSEN-SALSBERY LABORATORIES, INC.
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